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I-395/Route 9 Transportation Study. Final Environmental Impact Statement 2015

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I-395/Route 9 Transportation Study

Final Environmental Impact Statement



Brewer, Holden, Eddington, and Clifton, Maine

FHWA-ME-EIS-12-01-F

MaineDOT Project Identification Number: 008483.20

FHWA: NH-8483(20)E

January 2015

Submitted Pursuant to 42 U.S.C. 4332 (2)(c) by the

*Federal Highway
Administration*



and Cooperating Agencies

U.S. Fish & Wildlife Service, U.S. Environmental Protection Agency, U.S. Army Corps of Engineers,
National Oceanic and Atmospheric Administration–National Marine Fisheries Service,
Maine Department of Environmental Protection, and Maine Historic Preservation Commission

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 1/12/15
Date

David Bernhardt, P.E.

Commissioner; Maine Department of Transportation

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The Maine Department of Transportation (MaineDOT) and the Maine Division of Federal Highway Administration (FHWA) have undertaken the I-395/Route 9 Transportation Study to evaluate transportation alternatives to improve regional system linkage, relieve traffic congestion, and improve safety along Routes 1A and 46, and to improve the current and future flow of traffic and the shipment of goods to the Interstate system. This Environmental Impact Statement examines the environmental effects of the “No-Build” Alternative and three build alternatives developed to satisfy the study purpose and needs. The purpose of this is to provide the FHWA, the MaineDOT, the U.S. Army Corps of Engineers (USACE), and the public with a full accounting of the environmental impacts to the natural, social, atmospheric, economic and transportation environments. The EIS serves as the primary document to facilitate review of the project by federal, state, and local agencies and the general public.

After careful consideration of the range of alternatives developed in response to the study's purpose and needs and in coordination with its cooperating and participating agencies and public input, the MaineDOT and the FHWA have identified Alternative 2B-2 as its preferred alternative because it best satisfies the study purpose and needs, would fulfill their statutory mission and responsibilities, and has the least adverse environmental impact.

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Preface

The Federal Council on Environmental Quality (CEQ) Regulations for implementing the National Environmental Policy Act (40 CFR 1500-1508) (NEPA) place heavy emphasis on reducing paperwork, avoiding unnecessary work, and producing documents that are useful to decision-makers and the public. With these objectives in mind, the final environmental impact statement (FEIS) was prepared using a condensed format. This approach avoids repetition of material from the draft EIS (DEIS) by incorporating, by reference, the DEIS. Thus, the FEIS is a much shorter document than under the traditional approach; however, it does afford the reader a complete overview of the study and its impacts on the human environment.

The purpose of this approach is to briefly reference and summarize information from the DEIS that has not changed, and to focus the FEIS discussion on changes in the study's setting, impacts, technical analysis, and mitigation measures that have occurred since the DEIS was circulated. In addition, the condensed FEIS identifies the preferred alternative, explains the basis for its selection, describes coordination efforts, includes agency and public comments on the DEIS, provides responses to these comments, and presents findings or determinations required by law or regulation.

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Summary

The Maine Department of Transportation (MaineDOT) and the Federal Highway Administration (FHWA) have undertaken the Interstate 395/ Route 9 Transportation Study to identify a regional solution that would improve transportation-system linkage, safety, and mobility between I-395 and Route 9 along Routes 1A and 46, and to improve the current and future flow of traffic and the shipment of goods to/from the Interstate system in southern Penobscot County, Maine (exhibits S.1 and S.2). The U.S. Environmental Protection Agency, U.S. Fish & Wildlife Service, U.S. Army Corps

of Engineers, National Oceanic and Atmospheric Administration–National Marine Fisheries Service, Maine Department of Environmental Protection, and Maine Historic Preservation Commission acted as cooperating agencies for the study.

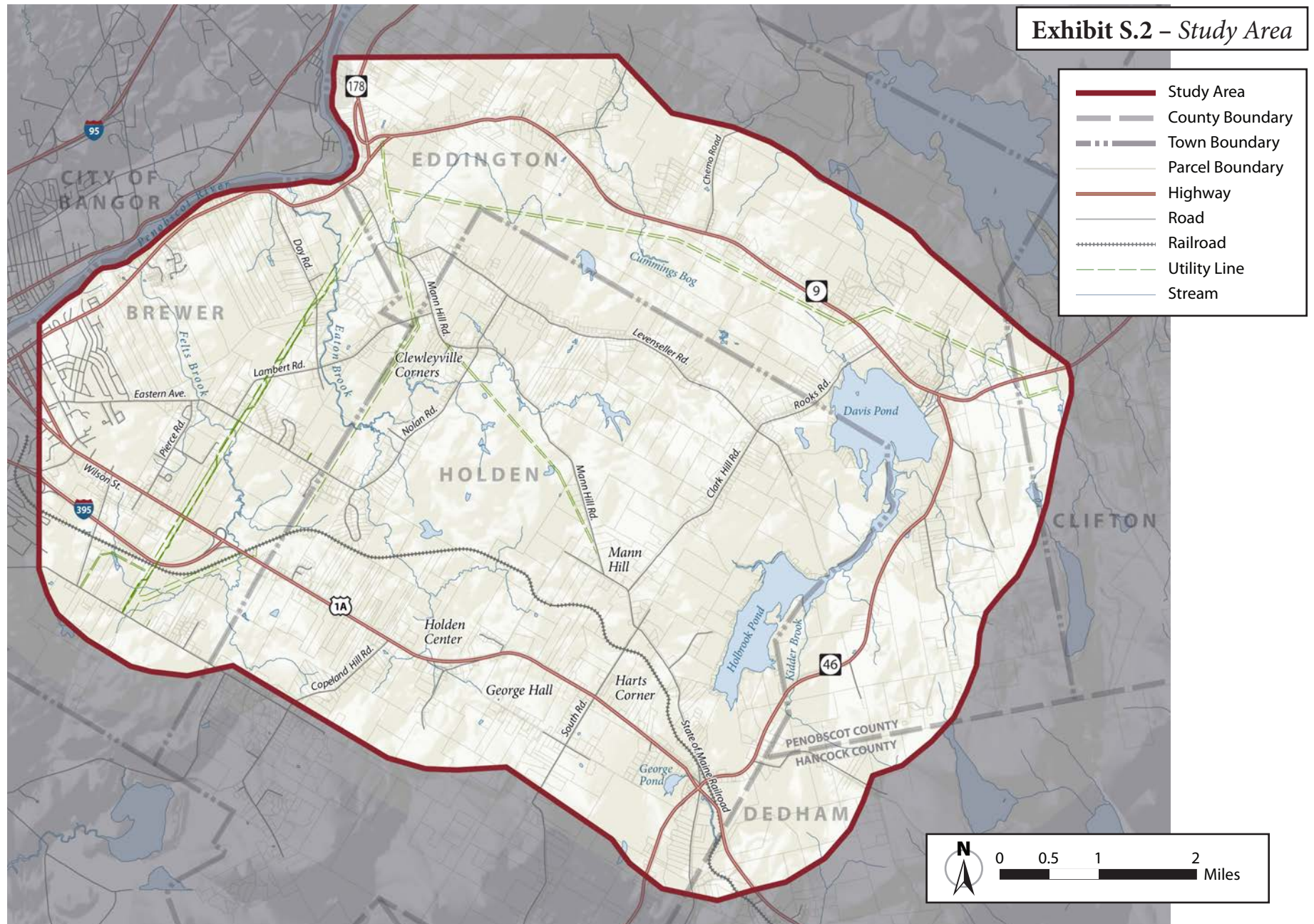
Exhibit S.1 – Location Map



“Cooperating agency” means any Federal agency other than a lead agency which has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposal (or a reasonable alternative) for legislation or other major Federal action significantly affecting the quality of the human environment. A state or local agency of similar qualifications...may by agreement with the lead agency become a cooperating agency (40 Code of Federal Regulations [CFR] 1508.5).

Chapter Contents

Purpose
Needs
Alternatives
Impacts to the Natural and Social Environment
Areas of Controversy
Additional Actions Required
Circulation of the DEIS and Summary of Substantive Comments



The opening of I-395 in November 1986, the State of Maine's east–west highway initiative, and the creation of the federal National Highway System (NHS) established the impetus for this study.

Purpose

The purposes of the I-395/Route 9 Transportation Study are to (1) identify a section of the NHS in Maine from I-395 in Brewer to Route 9 in Eddington, consistent with the current American Association of State Highway and Transportation Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets*; (2) improve regional system linkage; (3) improve safety on Routes 1A and 46; and (4) improve the current and future flow of traffic and the shipment of goods to the Interstate system. The logical termini of the project was identified and defined as (1) I-395 near Route 1A and (2) the portion of Route 9 in the study area.

In accordance with section 404 of the Clean Water Act (CWA), the U.S. Army Corps of Engineers (USACE) is required to prepare a basic purpose statement to determine compliance with the CWA Section 404(b) (1) guidelines. Accordingly, the USACE determined that the basic project purpose “...is to provide for the safe and efficient flow of east-west traffic and shipment of goods from Brewer (I-395) to Eddington (Route 9), Maine, for current and projected traffic volumes.”

Needs

The need (i.e., the problem) for transportation improvements is based on poor roadway geometry in the study area combined with an increase in local and regional commercial and passenger traffic that has resulted in poor system linkage, safety concerns, and traffic congestion.

Poor System Linkage

Vehicles traveling through the study area from I-395 to Route 9 generally proceed from I-395 to Routes 1A, 46, and 9 — a path that has abrupt transitions in travel speed, roadway geometry, and capacity, as follows:

- I-395 is a principal arterial highway between I-95 in Bangor and Route 1A in the study area. I-395 is a controlled-access highway with two eastbound and two westbound lanes separated by an approximate 50-foot grass median. It connects to Route 1A in Brewer with a partial cloverleaf interchange. I-395 has a posted speed of 55 miles per hour (mph) and has a paved shoulder approximately 10 feet wide.
- Route 1A is a principal arterial highway connecting the greater Bangor and Brewer area with Ellsworth and the coast at Bar Harbor. West of the I-395 interchange, Route 1A has two eastbound lanes and two westbound lanes.

Logical termini are features such as cross-route locations that are considered rational end-points for a transportation improvement and that serve to make it usable.

A principal arterial highway is a highway found in both urban and rural areas that connects urban areas, international border crossings, major ports, airports, public transportation facilities, and other intermodal transportation facilities.

A controlled-access highway is a highway that provides limited points of access. Interstate highways are controlled-access highways in which access points occur only at interchanges.

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Access Management

The 119th Maine Legislature approved LD 2550, An Act to Ensure Cost-Effective and Safe Highways in Maine. The purpose of the Act is to ensure the safety of the traveling public and protect highways against negative impacts of unmanaged access.

The Act specifically directs the MaineDOT and authorized municipalities to promulgate rules to ensure safety and proper access on all state and state-aid highways with a focus on maintaining posted speeds on arterial highways outside urban compact areas.

More information can be found at <http://www.state.me.us/mdot/planning-process-programs/amprogram.php>.

East of the I-395 interchange, Route 1A has one eastbound lane, one westbound lane, and a center turn lane from Brewer to approximately 1.3 miles east of the I-395 interchange. The remainder of Route 1A in the study area and to the coast has one eastbound and one westbound lane with no center turn lane. Route 1A is not a controlled access highway and access from its adjacent properties is subject to Maine's rules on access management. Route 1A in the study area is posted at 25 to 45 mph, depending on location, and has a paved shoulder approximately 6 feet wide. The land uses adjacent to Route 1A in the study area are primarily commercial and residential with some undeveloped and underdeveloped areas. Over time, the areas adjacent to Route 1A are becoming increasingly more commercial.

- Route 46 is a two-lane collector road connecting Route 1A to Route 9. Route 46 is not a controlled access highway and access from its adjacent properties is subject to Maine's rules on access management. Portions of Route 46 are steep and exceed the State of Maine's design criteria. Route 46 is posted at 35 or 45 mph and has a gravel shoulder approximately four feet wide. The land cover adjacent to Route 46 is primarily mature forested areas with scattered residences,

a school, and open areas. Approaching Route 9, the land uses adjacent to Route 46 are primarily residential. Because of the mature forest canopy, considerable portions of Route 46 are shaded, and snow and ice cover does not melt rapidly.

- Route 9 is a two-lane principal arterial highway connecting the greater Bangor and Brewer area with Washington County and the Canadian Maritime Provinces to the east. Route 9 is not a controlled access highway and access from its adjacent properties is subject to Maine's rules on access management. Route 9 is posted at 35 or 55 mph with some school zones, depending on location in the study area, and has a paved shoulder approximately eight feet wide. The land uses adjacent to Route 9 in the study area are primarily commercial and residential with some undeveloped and underdeveloped areas. Over time, the areas adjacent to Route 9 are becoming increasingly more developed. To the east of the study area, the land uses and land cover adjacent to Route 9 quickly become less developed and more forested, and the speed limit increases to 55 mph. Most of the land adjacent to Route 9 east of the study area to the Canadian border is undeveloped.

The portions of Routes 1A and 46 in the study area do not provide a high-speed, controlled-access arterial highway between I-395 and Route 9 to the east. These two roads do not provide an operationally efficient transportation facility for regional connectivity and mobility through the study area. The results of these deficiencies in system linkage are safety concerns, delays in passenger and freight movement, and conflicts between local and regional traffic.

Safety Concerns

Locations in the study area exhibit higher crash rates than other locations in Maine with similar characteristics. Data were collected and analyzed to identify high crash locations (HCLs) using a critical rate factor (CRF). The CRF of an intersection or roadway section is a statistical measure of that location's crash history as compared to locations with similar geography, traffic volume, and geometric characteristics. When a CRF exceeds 1.00, the intersection or portion of a roadway has a higher-than-expected crash rate. Those locations with a CRF higher than 1.00 and more than eight crashes in a three-year period are considered HCLs. Data were collected and analyzed to identify HCLs in the study area. MaineDOT crash data for January 2004 through December 2008 indicate 10 HCLs that meet the criteria in the study area. The majority of crashes occurred on clear days with dry road conditions.

Traffic Congestion

Since the extension of I-395 from Bangor to Route 1A in 1986, traffic volumes in the study area have increased steadily. This growth has been most pronounced along Route 46 between Routes 1A and 9, which has become more widely used by both passenger vehicles and trucks as a connection among I-95, I-395, and Route 9. Much of the truck traffic in the study area is through-traffic. Most of the truck trips are between the Canadian Maritime Provinces and Washington County at the eastern end, and Penobscot County and the New England states at the western terminus of the trips. Approximately 80 percent of truck traffic on Route 9 uses Route 46, and approximately five of six heavy trucks that use Routes 46 and 1A also use I-395. Route 46 south of Route 9 exhibited the greatest annual growth rate (i.e., annual growth factor of 1.121) in heavy-truck traffic between 1983 and 1996 of all roads in the greater Bangor area.

Estimates of the current and future annual average daily traffic (AADT) for all vehicles and heavy trucks were determined based on MaineDOT traffic count data (exhibit S.3). In 2008, with the economic downturn and increase in the price of gas, traffic in the study area has not grown as fast as previously predicted. The MaineDOT and FHWA believe the growth in traffic and traffic volumes originally forecast for the study area for the year 2030 won't materialize until the year 2035. By 2035, traffic volumes on Route 46 between Routes

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Exhibit S.3 – Existing and Future Traffic

<i>Location</i>	<i>1998 AADT</i>	<i>2006 AADT</i>	<i>2010 AADT</i>	<i>2035 AADT</i>	<i>2010 Truck AADT</i>	<i>2035 Truck AADT</i>	<i>% Growth 1998–2035</i>	<i>Growth Per Year 1998–2035</i>
Route 1A east of I-395	18,140	20,370	22,236	33,070	1,569	2,449	82%	2.57%
Route 1A west of Route 46	16,550	15,220	16,976	30,600	1,569	2,449	85%	2.65%
Route 1A east of Route 46	11,220	11,260	12,116	18,870	1,569	2,449	68%	2.13%
Route 46 south of Route 1A	1,920	1,870	2,021	3,130	265	281	63%	1.97%
Route 46 north of Route 1A	2,270	2,270	3,058	8,570	604	1,167	278%	8.67%
Route 9 east of Route 178	6,440	6,870	7,156	8,730	569	662	36%	1.11%
Route 9 west of Route 46	4,780	5,050	5,129	5,410	604	1,167	13%	0.41%
Route 9 east of Route 46	5,100	5,400	5,830	10,940	879	1,535	115%	3.58%

1A and 9 are forecasted to increase by approximately 6,300 vehicles.

The projected increases in traffic would lead to more traffic congestion. To help measure the traffic-congestion problem and the quality of traffic flow, the MaineDOT modeled existing (1998 and 2006) and future (2035) design hour volumes (DHVs) of traffic for three roadways in the study area: Routes 1A, 9, and 46. The DHV is the 30th highest hour of travel during a year at a given location; therefore, it accurately reflects the heaviest summer travel congestion. The MaineDOT used the DHVs to determine the volume-to-capacity (v/c) ratio, operating speeds, and overall level of service (LOS) for the following five roadway segments within the study area: (1) Route 1A east of the

I-395 interchange and west of Route 46; (2) Route 1A east of Route 46; (3) Route 46 between Routes 1A and 9; (4) Route 9 east of Route 178 and west of Route 46; and (5) Route 9 east of Route 46.

The MaineDOT estimated the DHV, v/c ratios, LOS, and average travel speed of these roadway segments using peak season 1998 and 2006 travel conditions and forecasted peak season 2035 travel conditions (exhibit S.4). Route 1A east of the I-395 interchange and west of Route 46 is forecasted to decrease in service from LOS E in 1998 to LOS F by 2035. LOS F represents heavily congested flow with traffic demand exceeding capacity. Route 1A east of Route 46 is forecasted to decrease from LOS D in 1998 to LOS E by 2035. LOS

E is defined as traffic flow on two-lane highways having a time delay of greater than 75 percent. Passing under LOS E conditions is virtually impossible. LOS E is seldom attained over extended sections of level terrain on more than a transient condition; most often, small disturbances in traffic flow as LOS E is approached causes a rapid transition to LOS F.

The intersection of Routes 1A and 46 is a signalized intersection. This intersection serves traffic traveling to and from the areas of Downeast Maine and traffic to and from the Ellsworth area and the coast. In 1998, the overall performance of this intersection was estimated using peak-volume conditions at LOS B. By 2035, with increases in traffic volume and corresponding increases in delays, this intersection is forecasted to decline to an overall performance of LOS F. LOS F at a signalized intersection describes a control delay exceeding 80 seconds per vehicle. This LOS occurs when arrival flow rates exceed the capacity of the intersection.

In 1998, the delay on northbound Route 46 to the intersection of Routes 46 and 9 was estimated using peak-volume conditions to be 6.5 seconds (LOS A). By 2035, with increases in traffic volume, this delay is forecasted to increase to 119.4 seconds (LOS F).

Alternatives

From 2001 to 2011, the MaineDOT and the FHWA conceptually designed and analyzed the No-Build

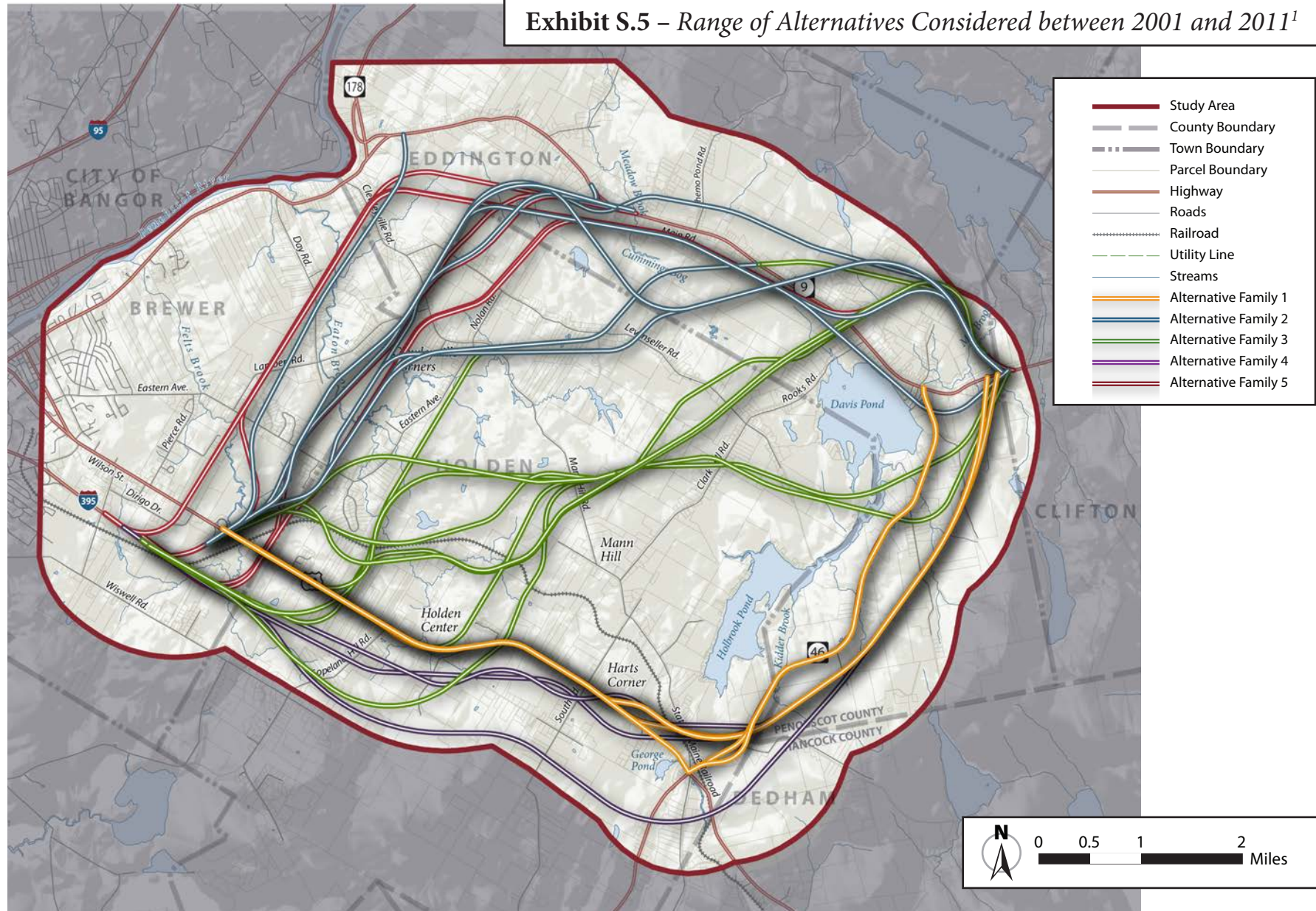
Exhibit S.4 – DHV, v/c Ratio, LOS, and Average Travel Speed for Roadways Segments

Year	DHV	v/c Ratio	Average Travel Speed (mph)	LOS Rural Two-Lane Road
Route 1A east of I-395				
1998	1,840	0.63	34.6	E
2006	2,001	0.69	33.2	E
2035	3,269	1.12	varies	F
Route 1A east of Route 46				
1998	1,282	0.43	44.1	D
2006	1,268	0.43	44.2	D
2035	2,123	0.72	37.5	E
Route 46 between Routes 1A and 9				
1998	244	0.14	45.1	C
2006	197	0.12	45.6	C
2035	1,006	0.40	40.8	D
Route 9 east of Route 178				
1998	641	0.27	41.2	D
2006	629	0.26	41.3	D
2035	873	0.36	39.5	E
Route 9 east of Route 46				
1998	505	0.20	43.9	D
2006	573	0.23	43.5	D
2035	1,267	0.46	39.3	E

Alternative and more than 70 build alternatives that could potentially satisfy the study purpose and needs and the USACE basic project purpose (exhibit S.5). The build alternatives would be controlled-access highways and were conceptually designed using the MaineDOT design criteria for freeways.

Two lanes, one in each direction, would be constructed and used for two-way travel within an approximate

Exhibit S.5 – Range of Alternatives Considered between 2001 and 2011¹



¹ **Note:** Alternative alignments shown here have been grouped into families. For a detailed discussion of each family, please refer to Appendix C in the DEIS.

200-foot-wide right-of-way. In designing and analyzing alternatives, the MaineDOT and the FHWA consulted with regulatory and resource agencies at the state and federal level, local officials, special-interest groups, the Public Advisory Committee (PAC), native American tribal governments and the public. At the end of the process of identifying, developing, analyzing, and screening alternatives, four alternatives, including the No-Build Alternative, were retained for further consideration and detailed study.

A screening process, undertaken in several stages, was established to systematically consider the wide range of potential alternatives and to identify a reasonable number to be retained for detailed analysis (see Appendix C of the Draft Environmental Impact Statement [DEIS]). The screening analysis considered alternatives that fit into five broad “families”, as follows:

- **Family 1: The Upgrade Alternatives.** Widening and other improvements to Route 1A (from I-395 to Route 46) and Route 46 (from Route 1A to Route 9) approximately 10 miles long. Although one upgrade alternative was initially considered, six upgrade and five partial-upgrade alternatives were reviewed during the alternatives screening process.
- **Family 2: The Northern Alternatives.** Alternatives that began at the I-395/Route 1A interchange and generally proceeded in a

northerly direction to connect with Route 9. These alternatives were five to 10 miles in length, depending on the distance on Route 9 used as part of the alternative. Twelve alternatives in this family were reviewed.

- **Family 3: The Central Alternatives.** Alternatives that began at or near the I-395/Route 1A interchange and generally proceeded east and west through the study area to Route 9 east of Route 46. These alternatives were seven to 11 miles in length, depending on the distance on Route 9 used as part of the alternative. Using all possible combinations of the six western components, the four eastern components, and component 3K, 36 possible central alternatives were initially created. Five other alternatives (for a total of 41) in this family were developed by modifying some of the initial 36 alternatives.
- **Family 4: The Southern Alternatives.** Alternatives that began near the I-395/Route 1A interchange and that were south of Route 1A and east of Route 46. These alternatives paralleled Routes 1A and 46, and intersected Route 9 in East Eddington. These alternatives were approximately 11 miles in length. Four alternatives were identified and considered: 4A, 4B, 4C, and 4D.
- **Family 5: Alternatives Paralleling Existing Utility Easements.** Alternatives that began at or

near the I-395/Route 9 interchange and proceeded in a northerly direction paralleling the utility easements (to the extent possible) to connect with Route 9 in East Eddington. These alternatives were approximately 11 miles in length. Eight alternatives in this family were reviewed.

The No-Build Alternative was fully developed to allow an equal comparison to the build alternatives and was carried through the screening process.

In 2001, the MaineDOT and the FHWA, using results of the preliminary impacts analysis, dismissed from further consideration 37 of the initial 45 alternatives because other alternatives were either less environmentally damaging, or they did not meet the purpose or all of the needs of the study. The analysis performed in 2001 retained an alternative from each family with the least adverse impact to the features and resources and resulted in the No-Build Alternative and seven alternatives.

The development and screening of alternatives continued through 2008. New alternatives, modifications of alternatives, and combinations of alternatives were considered. In 2004, alternatives were identified and developed parallel to the utility easements with the Bangor Hydro-Electric Company transmission lines noted as Family 5. The process of identifying, developing, and screening alternatives or modifying alternatives continued. In January 2008, seven new alternatives, including the No-Build

Alternative, were preliminarily identified for further consideration, development and detailed study.

In December 2008, in a continued effort to avoid and minimize adverse impacts, six connectors between the three westernmost build alternatives were identified, developed, and analyzed.

The process of identifying, developing, and screening alternatives or modifying alternatives continued. New alternatives, modifications of alternatives, and combinations of alternatives were considered. In September and December 2010, meetings with the federal cooperating agencies took place, the purpose of which was to solidify the range of alternatives to be considered in detail (see Appendix C in the DEIS).

The following four alternatives were retained for further consideration and detailed study (exhibit S.6):

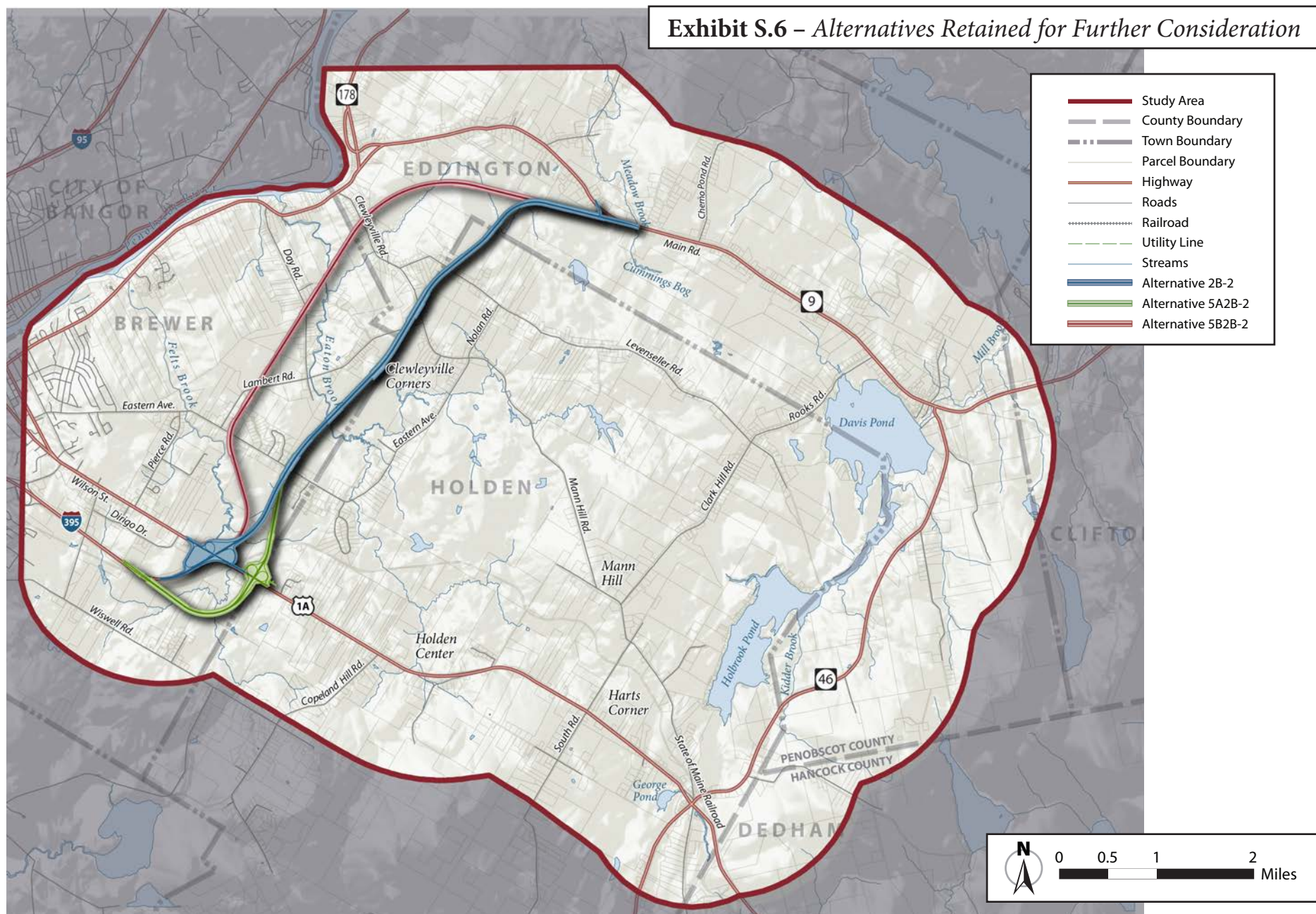
- No-Build Alternative
- Alternative 2B-2
- Alternative 5A2B-2
- Alternative 5B2B-2

The cooperating agencies concurred with this range of alternatives to be retained for detailed analysis.

The No-Build Alternative

The No-Build Alternative consists of maintenance and Transportation System Management (TSM)

Exhibit S.6 – Alternatives Retained for Further Consideration



improvements. Regular maintenance consists of surface and shoulder work, ditch, bridge, culvert maintenance, snow and ice removal, emergency maintenance, mowing, brush control and other vegetation management, maintenance of stormwater runoff and management systems, erosion repair, striping, sign installation, and guardrail replacement. TSM is a set of relatively low-cost measures to increase capacity and/or provide safety improvements on an existing transportation system. These measures typically include traffic-signal timing or phasing adjustments, designation of turning lanes at specific intersections or driveways, access-management improvements, and enhanced signage or markings. The No-Build Alternative serves as the baseline to which other alternatives can be compared. The No-Build Alternative proposes that there be no new construction or major reconstruction of the transportation system in the study area; regular maintenance to I-395 and Routes 1A, 46, and 9 would be continued at its present level; and the intersection of Routes 46 and 9 would be improved.

The No-Build Alternative would not satisfy the study's purpose and needs or the USACE's basic purpose as it would not improve regional mobility and system linkage; would not improve safety; and would not reduce traffic congestion. The No-Build Alternative is retained for detailed analysis to allow equal comparison to the build alternatives and to help

decision makers understand the ramifications of taking no action. The impacts of the No-Build Alternative were fully developed for design year 2035 to demonstrate the full impact of taking no action. Comparing the build alternatives with the current and future No-Build Alternative is essential for measuring the true benefits and adverse impacts of the build alternatives considered in detail.

Alternative 2B-2

Alternative 2B-2 would continue north from the I-395 interchange with Route 1A, roughly paralleling the Brewer/Holden town line, and connect with Route 9 west of Chemo Pond Road. Route 9 would not be widened to four lanes. The existing I-395/Route 1A interchange would be used (to the extent possible) and expanded to become a semidirectional interchange. A semidirectional interchange reduces left turns and cross traffic; the only traffic movement that would require a left turn would be Route 1A south to Alternative 2B-2 north. The land required for the northern portion of the interchange is owned by the State of Maine.

Alternative 2B-2 would bridge over Felts Brook in two locations at the I-395 interchange. It would pass underneath Eastern Avenue between Woodridge Road and Brian Drive. Alternative 2B-2 would bridge over Eaton Brook, bridge over Lambert Road, pass underneath Mann Hill Road, and bridge over

Levenseller Road connecting to Route 9 at a “T” intersection. Route 9 eastbound would be controlled with a stop sign.

Alternative 2B-2 would further the study’s purpose and satisfy the system linkage need in the near term (the year 2035). Alternative 2B-2 would be a controlled-access highway and conceptually designed using the MaineDOT design criteria for freeways. Two lanes would be constructed and used for two-way travel within an approximate 200-foot-wide right-of-way. Route 9 would not be improved, and it would not provide high-speed, limited access connection to the east of East Eddington village. It would satisfy the study need related to traffic congestion and safety. It would satisfy the USACE’s basic purpose statement.

Alternative 5A2B-2

Alternative 5A2B-2 would start from I-395 for approximately one mile along the southern side of Route 1A in the town of Holden before turning northward, crossing over Route 1A and paralleling the Bangor Hydro-Electric Company utility easement to connect with Route 9 west of Chemo Pond Road (exhibit S.6). Route 9 would not be widened to four lanes. Alternative 5A2B-2 would connect to Route 1A with a modified diamond interchange, which would provide all traffic movements and require two left turns across traffic. A left-turn lane would be provided on Route 1A to 5A2B-2 north. The modified-diamond interchange design would reduce the amount of property that must be acquired.

Today, the current AADT along Route 9 in Eddington between the terminus of the Alternative 2B-2 and the Route 46 intersection is approximately 5,000 vehicles per day. The posted speed in this section of Route 9 is predominantly 45 mph, with 35 mph near the Route 46 intersection. Traffic on Route 9 can comfortably travel at the current posted speeds. This segment of Route 9 was constructed to a width that meets current National Highway System standards for 2-lane highways (12-foot travel lanes and 8-foot shoulders).

With Alternative 2B-2, the 2035 AADT along this segment of Route 9 is forecast to be approximately 12,000 vehicles per day. At that level of traffic flow, Route 9 can easily be maintained at the current posted speeds. There are many locations in Maine where AADTs of 15,000 to 17,000 are accommodated on 2-lane highways with 35-to-50 mph speeds. Many of these locations have more intense commercial development than Route 9 in Eddington. This indicates that traffic volume growth on Route 9 can be accommodated well beyond the year 2035.

As part of its planning process, MaineDOT regularly monitors traffic volume and traffic safety trends on all state highways, including Route 9. Traffic volumes are updated every three years, and crash data is reviewed annually to identify emerging conditions that would compromise safety and mobility. MaineDOT regulates development access to Route 9 through application of access management rules. These rules require a new development to provide safe access and maintain adequate mobility on the highway.

One way of maintaining safety and mobility along Route 9 as future development occurs is by establishing turn lanes where needed to minimize conflicts between turning traffic and through traffic. This treatment improves the safety of turns while maintaining or improving the flow of through traffic. There are examples in Maine where AADTs of 17,000 to 19,000 are accommodated on 3-lane highways (which have a 2-way left turn lane between the through lanes) with 40-to-50 mph speeds. Route 9 is adaptable **within the existing Right-of-Way** to this type of treatment, if conditions warrant.

With the capacity to accommodate much more than the forecasted traffic, the regular monitoring of safety and mobility conditions by MaineDOT, and the ability to accommodate additional development in a safe and efficient manner, the transportation benefits of Alternative 2B-2 should be sustainable well beyond 2035.

Alternative 5A2B-2 would bridge over Felts Brook in two locations at the I-395 interchange. It would pass underneath Eastern Avenue between Woodridge Road and Brian Drive. Alternative 5A2B-2 would bridge over Eaton Brook, bridge over Lambert Road, pass underneath Mann Hill Road, and bridge over Levenseller Road connecting to Route 9 at a “T” intersection. Route 9 eastbound would be controlled with a stop sign.

Alternative 5A2B-2 would further the study’s purpose and satisfy the system linkage need in the near term (the year 2035). Alternative 5A2B-2 would be a controlled-access highway and conceptually designed using the MaineDOT design criteria for freeways. Two lanes would be constructed and used for two-way travel within an approximate 200-foot-wide right-of-way. Route 9 would not be improved, and it would not provide a high-speed, limited-access connection to the east of East Eddington village. It would satisfy the study need related to traffic congestion and safety. It would satisfy the USACE’s basic purpose statement.

Alternative 5B2B-2

Alternative 5B2B-2 would continue north from the I-395 interchange with Route 1A before turning east and connecting with Route 9 west of Chemo Pond Road (exhibit S.6). Route 9 would not be widened to four lanes. The existing I-395/Route 1A interchange would be used (to the extent possible) and expanded to

become a semidirectional interchange. The only traffic movement that would require a left turn would be Route 1A south to Alternative 5B2B-2 north. The land required for the northern portion of the interchange is owned by the State of Maine.

Alternative 5B2B-2 would bridge over Felts Brook in two locations at the I-395 interchange. It would bridge over Eastern Avenue to the immediate east of Lambert Road and bridge over Lambert Road. It would pass under Day Road and Chewleyville Road before turning east and connecting to Route 9 at a “T” intersection. Route 9 eastbound would be controlled with a stop sign.

Alternative 5B2B-2 would further the study’s purpose and satisfy the system linkage need in the near term (the year 2035). Alternative 5B2B-2 would be a controlled-access highway and conceptually designed using the MaineDOT design criteria for freeways. Two lanes would be constructed and used for two-way travel within an approximate 200-foot-wide right-of-way. Route 9 would not be improved, and it would not provide a high-speed, limited-access connection to the east of East Eddington village. It would satisfy the study need related to traffic congestion and safety. It would satisfy the USACE’s basic purpose statement.

Identification of a Preferred Alternative

During the study, it appeared that alternatives other than Alternative 2B-2 would best satisfy the study

purpose and needs. However, it became clear that 1) those alternatives would result in greater adverse environmental impacts than Alternative 2B-2, and 2) Route 9 had adequate capacity and would continue to operate at an acceptable level of service and operating speed up to and beyond the year 2035 (the time period that has been determined to be reasonably foreseeable). A preferred alternative that best satisfies the study purpose and needs with the least adverse environmental impact was not identified prior to the identification of Alternative 2B-2 as the preferred alternative in the DEIS.

On three occasions during the study, Alternative 2B-2 (including earlier versions Alternative 2B and 2B-1) was tentatively dismissed from the range of reasonable alternatives considered for satisfying the study purpose and needs only to be added back to the range of alternatives considered. On each occasion, MaineDOT, in consultation with the PAC, tentatively dismissed it (pending concurrence from the Federal and state regulatory and resource agencies) and, in subsequent discussions with the Federal cooperating agencies, reconsidered it because it was practical and resulted in less adverse environmental impacts than other alternatives.

After careful consideration of the range of alternatives developed in response to the study's purpose and needs and in coordination with its cooperating and participating agencies, MaineDOT and the FHWA identified

Alternative 2B-2 as their preferred alternative because it best satisfies the study purpose and needs, would fulfill their statutory mission and responsibilities, and has the least adverse environmental impact between the present time and the design year 2035. In identifying Alternative 2B-2 as their preferred alternative, MaineDOT and the FHWA have identified the environmentally preferable alternative because it best meets the purpose and needs for the study; causes the least damage to the biological and physical environment; and best protects, preserves, and enhances the historic, cultural, and natural resources of the study area.

Alternative 2B-2 was identified on July 31, 2013 as the Least Environmentally Damaging Practicable Alternative (LEDPA) by the USACE (see Appendix B), and as such the alternative that could receive a permit from the USACE.

Impacts to the Natural and Social Environment

A study area of approximately 34,416 acres encompassing the range of reasonable alternatives was identified, and a detailed analysis of the natural, social, and economic features of the study area was performed. The study area covers not only the land that would be used for the build alternatives but also the areas that would experience direct, indirect, and cumulative impacts from them.

The No-Build Alternative would adversely impact the study area by failing to reduce traffic backups on Routes 1A, 9, and 46; failing to address safety problems at 10 HCLs; and negatively impacting the community character of Brewer, Holden, and Eddington by not reducing heavy traffic in the study area. Traffic congestion in the study area is projected to worsen under the No-Build Alternative.

From a broad perspective, the build alternatives retained for further consideration are quite similar. They would begin in the same area of I-395 and Route 1A near the Brewer/ Holden town line, carry traffic north, and connect with Route 9 in Eddington. The build alternatives would have considerable beneficial impacts to the study area and region. Each alternative would have similar positive impacts to mobility and congestion on Routes 1A, 9, and 46. The build alternatives would have the added benefit of improving safety throughout the study area and region.

Although the majority of the potential adverse impacts from the build alternatives are similar, a few distinct differences exist (exhibits S.7, S.8, and S.9).

The build alternatives would not substantially impact the physical geography; climate; geological resources; sand and gravel aquifers; wild and scenic rivers; groundwater; essential fish habitat; state endangered or threatened species; other protected species; tribal trust lands; communities; public properties; population, demographics, and labor force; community characteristics and conditions; minority and disadvantaged populations; sites containing uncontrolled

petroleum and hazardous wastes; historic resources; archaeological resources; and traditional cultural properties.

The Endangered Species Act (ESA) provides protection for those species that are listed as endangered or threatened under the ESA. Section 7 of the ESA requires that the U.S. Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) work with other federal agencies to achieve conservation and recovery of listed species and ensure proposed actions do not result in jeopardy to listed species or result in destruction or adverse modification to critical habitat. "Critical habitat" is a term defined and used in the ESA to designate a specific geographic area(s) that is essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but would be needed for its recovery.

There are three species of diadromous fish in the study area listed under the ESA. These species are the Atlantic sturgeon, which is listed as a threatened species, the shortnose sturgeon, which is listed as an endangered species, and the Atlantic salmon, which is listed as an endangered species with designated critical habitat in the study area (NOAA, NMFS 2012). In accordance with the January 2014 Section 7 Programmatic Agreement between FHWA, USACE, MaineDOT, USFWS and NMFS, MaineDOT determined that while the federally threatened Atlantic sturgeon and federally endangered shortnose sturgeon are known to occur within the study area, they are not present within the

Exhibit S.7 – Direct Impacts of Alternatives

Alternatives	Physical and Biological															Land Use				
	Wetlands (acres)	Roadway contaminants within 100 feet ¹ (acres)	Roadway contaminants within 160 feet ² (acres)	Streams				Floodplains (acres)	Vernal pools ³ /dispersal habitat ⁴ (acres)	Waterfowl and wading bird habitat (acres)	Deer-wintering areas (acres)	Federally-Listed Endangered Species	Vegetation (acres)	Undeveloped habitat	Area to be acquired (acres)	Historic Properties	4(f) Properties	Residential displacements ⁵	Business displacements ⁶	Business impacts ⁷
				Bridges and culverts/feet	Roadway contaminants within 100 feet ¹ (acres)	Roadway contaminants within 160 feet ² (acres)	Sediments within 3,300 feet ² (acres)													
No-Build	-	17	64	-	0.3 ac. (17,000 sq. ft.)	0.7 ac. (29,000 sq. ft.)	12 ac.	-	-	-	-	-	-	-	-	-	-	-	-	-
	Impacts from maintenance activities			Impacts from maintenance activities							Impacts from maintenance activities									
2B-2/the Preferred Alternative	26	31	66	5 bridges 1 culvert/ 212 feet	0.9 ac. (39,100 sq. ft.)	1.8 ac. (78,300 sq. ft.)	13 ac.	10	1/17	9 acres along Eaton Brook and its tributaries	-	Yes	103	Eliminates two blocks; fragments three blocks	163	No	No	8	-	-
5A2B-2	31	34	71	5 bridges 1 culvert/ 212 feet	0.6 ac. (24,300 sq. ft.)	1.5 ac. (63,000 sq. ft.)	18 ac.	2	1/25	20 acres along Felts Brook and 9 acres along Eaton Brook	-	Yes	136	Eliminates two blocks; fragments four blocks	215	No	No	16	Brewer Fence Company, Eden Pure Heaters, Mitchell's Landscaping and Garden Center, Town 'N Country Apartments	-
5B2B-2	30	30	80	6 bridges 1 culvert/ 222 feet	1.0 ac. (43,700 sq. ft.)	2.0 ac. (90,000 sq. ft.)	17 ac.	11	1/8	3 acres along a tributary to Eaton Brook	3 acres along a tributary to Eaton Brook	Yes	102	Fragments four blocks	186	No	No	6	Bangor Hydro-Electric Co. Building, Maritimes and Northeast Pipeline Compressor Station	-

Notes:

Primary road contaminants are salt and lead.

No-Build Alternative consisted of Route 1A from I-395 to Route 46, and Route 46 from Route 1A to Route 9.

¹Source: USACE New England District, "Compensatory Mitigation Guidance", 2010.

²Source: Maine Audubon Society, "Conserving Wildlife On and Around Maine's Roads", 2007.

³All vernal pools are insignificant.

⁴Upland habitat within 250 ft.

⁵The taking of a residence

⁶The taking of a business

⁷An impact to the business without the taking of the business

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Exhibit S.8 – Indirect Impacts of Alternatives

Resources		Distances (feet)		Alternative Indirect Impacts (acres)							
		Upslope/ Upwind	Downslope/ Downwind	No-Build Alternative ⁴ Upslope	No-Build Alternative ⁴ Downslope	2B-2/the Preferred Alternative Upslope	2B-2/the Preferred Alternative Downslope	5A2B-2 Upslope	5A2B-2 Downslope	5B2B-2 Upslope	5B2B-2 Downslope
Soils		Erosion could affect water quality in surface waters.									
Surface Waters	Contaminants	160 ¹		0.7		1.8		1.5		2.0	
	Sediments	0 ¹	3,300 ¹	12		0	13	0	18	0	17
Groundwater		No indirect impacts									
Aquatic Habitat and Fisheries		160 ¹		0.7		1.8		1.5		2	
Vernal Pools	Area	250 ²		54		17		25		8	
	Percent Forested			25 (46%)		10 (60%)		20 (78%)		7 (83%)	
	Percent Wetland			17 (31%)		8 (47%)		20 (80%)		4 (50%)	
	Percent Upland			37 (69%)		9 (53%)		5 (20%)		4 (50%)	
	Area	750 ²		480		278		395		146	
	Percent Forested			254 (53%)		175 (63%)		233 (59%)		101 (69%)	
	Percent Wetland			101 (21%)		109 (39%)		177 (45%)		49 (34%)	
	Percent Upland			379 (79%)		169 (61%)		218 (55%)		97 (66%)	
Floodplains		0	100 ³	0	1	0	11	0	5	0	15
		160 ¹		4		22		8		28	
Wetlands		0	100 ³	0	17	0	31	0	34	0	30
		160 ¹		64		66		71		80	
Vegetation	Contaminants	160 ¹		164		232		252		202	
	Nitrogen enrichment and altered vegetation	160 ¹	330 ¹	95	187	88	292	92	312	116	240
	Invasive species	660 ¹	3,300 ¹	753	3,920	329	4,407	398	4,346	498	2,944
Wildlife	Large mammals	160 ¹	330 ¹	0	0	74	128	69	173	89	103
	Grassland birds	330 ¹	660 ¹	0	80	146	250	136	334	178	204
	IWWH	0	100 ³	0	2	0	10	0	19	0	4
Wildlife Habitat		660 ¹	3,300 ¹	84	2,189	278	1,416	255	1,669	423	893

Notes:

¹Source: Maine Audubon Society, "Conserving Wildlife On and Around Maine's Roads", 2007.

²Source: USACE, New England District, "Compensatory Mitigation Guidance", 2010.

³ USEPA, 2010

⁴ No-Build Alternative consisted of Route 1A from I-395 to Route 46, and Route 46 from Route 1A to Route 9.

Exhibit S.9 – Cumulative Effects for the Build Alternatives

Alternative	Surface Waters	Floodplains (acres)	Wetlands (acres)	Forest Vegetation (acres)	Wildlife Habitat (acres)
2B-2/the Preferred Alternative	4,900 feet of streams; unknown impacts from stormwater runoff.	26	182	602	873
5A2B-2	5,000 feet of streams; unknown impacts from stormwater runoff.	18	187	636	924
5B2B-2	4,800 feet of streams; unknown impacts from stormwater runoff.	27	188	602	556

action area and therefore, determined the proposed action would not have an effect on these species. Also in accordance with the Section 7 Programmatic Agreement, MaineDOT determined that Atlantic salmon and its designated critical habitat were present within the study area and the action area and therefore, would require consultation with the USFWS.

On October 2, 2013, the northern long-eared bat (NLEB) was proposed for listing under the ESA by the USFWS. Critical habitat for the NLEB is not currently designated.

Following the circulation of the DEIS, MaineDOT prepared a Biological Assessment (BA) for the FHWA for the proposed project in compliance with Section 7 of the ESA. FHWA formally consulted with the USFWS under Section 7 of the ESA for effects of eight proposed crossings of perennial and intermittent streams for Alternative 2B-2/Preferred Alternative on the Atlantic salmon, Atlantic salmon critical habitat, and the NLEB.

One of these crossings is approximately 2,000 feet upstream of a historically inaccessible natural barrier and would have no permanent or temporary effects on Atlantic salmon or Atlantic salmon designated critical habitat. In addition, because final design for Alternative 2B-2/Preferred Alternative has not started, final plans, sizes, and types of crossing structures have not been determined (MaineDOT, 2013a).

The BA concluded that because the Penobscot River would not be affected directly or indirectly by the build alternatives, there would be no effect on Atlantic sturgeon and shortnose sturgeon. However, the build alternatives may affect, and are likely to adversely affect, Atlantic salmon and Atlantic salmon critical habitat because:

- Suitable Atlantic salmon migratory habitat is present in the study area.
- Pile driving activities and installation of cofferdams would have the potential to ‘take’ a species in the area of the project due to noise,

sedimentation, turbidity effects and the potential entrapment of a salmon inside a cofferdam and creation of a temporary passage barrier.

- Upstream and downstream passage could be blocked during construction of the crossing structures. Downstream migration may still be available if a bypass channel is utilized as part of the cofferdam. To minimize this, cofferdams would be removed immediately after completion of the crossing structures.
- Once constructed the proposed project would maintain full access to potential rearing habitat upstream of all crossing structures.

The BA concludes that the proposed project would not jeopardize the continued existence of the NLEB for the following reasons:

- The amount of forested clearing represents a very small fraction of forest available to NLEB
- The proposed project is not located near known hibernacula
- The type of project proposed is not one identified by USFWS as being most likely to result in lethal impacts or significant adverse effects to NLEB.

MaineDOT and FHWA are required to and would re-initiate Section 7 consultation with the USFWS when

the NLEB and/or its critical habitat become officially listed under the ESA.

The Federal ESA requires that Federal agencies consult with the USFWS and/or NMFS to determine if actions of an agency would have any effect on species listed under the ESA and to avoid any actions that may jeopardize the continued existence of the species or result in the destruction or adverse modification of designated critical habitat. The formal consultation process is concluded when USFWS issues a biological opinion (BO) that makes a determination of effect that includes terms and conditions of approval, a statement for potential incidental 'take' of the species, and conservation recommendations.

New information regarding the NLEB will be available and published in the Federal Register in April 2015 requiring further ESA section 7 conferencing or consultation for potential NLEB effects not addressed in the BA or the USFWS's BO.

In the BO issued on September 19, 2014, the USFWS concluded that the I-395/Route 9 connector would not jeopardize the continued existence of the NLEB due primarily to the minimal amount of potentially suitable habitat that would be permanently impacted relative to the total habitat area available (USFWS, 2014).

After considering the current status of Atlantic salmon and its designated critical habitat, the project's environmental baseline, the effects of the proposed

project, and the potential for future cumulative effects in the study area, the USFWS concluded the I-395/Route 9 connector is not likely to jeopardize the continued existence of the Atlantic salmon throughout all or a significant portion of its range (USFWS, 2014).

The I-395/Route 9 connector would result in short-term adverse effects to Atlantic salmon and its critical habitat during construction activities. These effects are small in scope and in some cases would be reversed upon completion of construction. Construction activities are expected to result in adverse effects of up to 40 juvenile Atlantic salmon and no adult Atlantic salmon. Many of the construction-related adverse effects to Atlantic salmon are not expected to result in mortality, but rather temporarily affect normal behavior through capture and relocation to another part of the stream or blocked access to upstream or downstream habitat that results in temporary disruption of normal activities (USFWS, 2014).

The USFWS concluded that critical habitat, including the habitat upstream of the I-395/Route 9 connector on Felts and Eaton Brooks and their tributaries, would function as suitable and unimpaired after construction is complete and these streams would continue to serve a conservation and recovery role for Atlantic salmon (USFWS, 2014).

Estimated Construction Costs

The estimated construction costs of alternatives include the costs of preliminary engineering,

construction engineering, utility relocation, acquisition of property for right-of-way, and mitigating environmental impacts. The costs of the build alternatives would range between approximately \$61 million and \$81 million (in 2011 dollars).

Areas of Controversy

The I-395/Route 9 transportation study has attracted substantial local interest since the beginning of the scoping process for the Environmental Assessment (EA) in 2000. On October 11, 2005, the I-395/Route 9 Transportation Study was elevated to an EIS by the FHWA because of the potential impacts to wetlands, unfragmented habitat, the potential difficulty in compensating for those impacts, and the potential impacts to the human environment.

Additional Actions Required

There are two primary issues to be resolved. The first is that MaineDOT must obtain permits from the USACE, a Natural Resources Protection Act permit from the Maine Department of Environmental Protection, and a Section 401 Water Quality Certification; for the second, MaineDOT would need to work with the affected municipalities to develop a corridor-preservation plan to protect the selected corridor from further development.

Section 404 of the CWA regulates the discharge of dredged or fill material into waters of the United States,

including wetlands. Section 404 requires a permit from the USACE before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from regulation (e.g., certain farming and forestry activities). The Section 404(b)(1) guidelines provide guidance to the USACE for issuing permits; compliance with the Section 404(b)(1) guidelines is required for the issuance of a permit. The Section 404(b)(1) guidelines require the selection of the LEDPA. Critical to the selection of the LEDPA is the recognition of the full range of alternatives and impacts in determining which alternatives are (1) practicable and (2) environmentally less damaging. The USACE identifies the LEDPA following its review of the preliminary permit application and completion of its public-interest finding.

The MaineDOT and the FHWA prepared a preliminary permit application in accordance with Section 404 of the CWA for the range of alternatives retained for further consideration, and it was submitted to the USACE. The USACE identified Alternative 2B-2 as the LEDPA. A mitigation plan for impacts to waters of the U.S. would be developed during final design.

A NRPA Permit is required from the Maine Department of Environmental Protection for projects in, on, over, or adjacent to protected natural resources. Protected resources are coastal wetlands, great ponds, rivers, streams, significant wildlife habitat, and freshwater wetlands.

Section 401 of the CWA regulates the discharge of dredged or fill materials into waters. A Section 401 Water Quality Certification is required from the MDEP to ensure that the project would comply with state water-quality standards. Typically, the Section 401 Water Quality Certification would be issued concurrently by the Maine Department of Environmental Protection with the NRPA Permit.

The portion of the study area in the city of Brewer is within the state's statutory coastal zone and subject to the provisions of the Coastal Zone Management Act (CZMA) of 1972 and the Maine CZM Program. The Maine Department of Agriculture, Conservation and Forestry administers the Maine Coastal Program. For efficiency, consistency reviews and determinations are rendered following the review and approval of state permit applications. This project would require a NRPA Permit issued by the MDEP and would require a CZM Consistency Determination issued with the NRPA Permit.

If a build alternative is selected for construction, the MaineDOT would work with the affected municipalities to develop a corridor-preservation plan to protect the selected corridor from further development. Methods to protect the corridor include development of zoning and local ordinances and selective acquisition of properties as they become available for sale or for further development. The MaineDOT may fund these property acquisitions through its customary programming of state and federal

highway-funding mechanisms. Property acquisitions and residential or business relocations would be in accordance with state and federal laws dictating the acquisition of property for highway purposes.

Once the MaineDOT has a system in place to protect the selected corridor, it would work with regional interests to develop support for a funding plan. In recent years, many states have found that state highway funds, bonding, and federal core apportionments are needed to maintain the system as it exists, with little remaining in additional funds for new capacity projects. Therefore, the MaineDOT would devise funding strategies for property acquisition and, ultimately, construction of the selected build alternative. If the No-Build Alternative is selected, the MaineDOT would continue to work with local and regional authorities to maintain—to the extent possible—the safety and efficiency of Routes 1A, 9, and 46 in Brewer, Holden, and Eddington.

Additionally, MaineDOT submitted an Interstate Modification Report to FHWA in October 2012 which received conceptual approval in February 2013. Final approval of the Interstate Modification Report cannot occur until after the process for complying with the National Environmental Policy Act is completed.

Circulation of the DEIS and Summary of Substantive Comments

The MaineDOT and the FHWA announced the availability of the I-395/Route 9 Transportation Study DEIS on March 23, 2012 (Federal Register, Vol. 77, No. 57). A 60-day comment period immediately followed, during which MaineDOT and FHWA invited Federal, State and local agencies, Tribes, organizations, and individuals to submit comments on the I-395/Route 9 Transportation Study DEIS. The MaineDOT and FHWA received 11 comment letters (some with attachments), seven comment forms (some with attachments), 79 comment e-mails and one petition.

Two open houses and a public hearing were held during the 60-day comment period. The first open house was on April 4, 2012 at the Brewer Auditorium and the second open house was on May 2, 2012 at the Eddington Town Office. The purposes of the two open houses were to 1) meet with people with an interest in the study to answer questions about the study and, 2) receive suggestions for further avoidance and minimization of potential impacts from the build alternatives and ways to improve the analysis of alternatives prior to decision-making. The Public Hearing was held on May 2, 2012 at the Eddington School and a transcript of the hearing was prepared. Nineteen attendees offered comments during the public hearing. The purpose of the public hearing

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was for the public to offer comments on the DEIS prior to preparation of the FEIS and decision-making; the public hearing was not a question and answer session. The public comment period on the I-395/Route 9 Transportation Study DEIS closed on May 15, 2012.

The MaineDOT submitted a preliminary permit application in accordance with Section 404 of the Clean Water Act to the U.S. Army Corps of Engineers. In response to the preliminary permit application, the U.S. Army Corps of Engineers issued their public notice soliciting comments on the study and range of issues addressed in the DEIS. The comment period on the preliminary permit application closed on May 17, 2012. The following is a list of the predominant themes, questions and concerns raised in comments on the DEIS:

- Route 9 is unsafe and would become more unsafe if Alternative 2B-2 is constructed
- Traffic on Route 9 is already heavy and traffic on Route 9 would increase if Alternative 2B-2 is constructed
- Truck traffic on Route 46 is heavy and Route 46 is unsafe for trucks to use
- We don't understand why impacts to vernal pools are considered more seriously than the displacement of peoples houses
- Is the I-395/Route 9 connector needed given the discussions of the private tolled East-West Highway?

- The build alternatives impact streams that contain Atlantic salmon
- Why didn't Alternative 2B-2 previously meet the study purpose and needs and now it does?
- Alternative 2B-2 is too expensive to construct
- The DEIS fails to consider recent changes to the zoning in Eddington
- The DEIS does not use the most current map of snowmobile trails
- Several new homes have been constructed that would be displaced by Alternative 2B-2 and are not shown in the DEIS
- How are the towns going to make up for the loss of tax revenue?
- We don't understand how a two-lane connector road will operate satisfactorily until at least 2035
- How will the connector impact emergency services and have the emergency service providers approved the connector as planned?
- Will Route 46 remain a state road or will it be given to the towns of Holden and Eddington?

All of these questions and concerns are addressed throughout the FEIS and in the Responses to Substantive comments in Appendix A. After reviewing the study and the comments on the study, the USACE identified Alternative 2B-2, MaineDOT's and FHWA's Preferred Alternative, as the LEDPA.

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Glossary

affected environment – The physical features and land area(s) to be influenced or impacted by an alternative alignment under consideration. This term also includes various social and environmental factors and conditions pertinent to an area.

agency coordination – A general term referring to the process whereby government agencies are afforded an opportunity to review and comment on transportation proposals.

alignment studies – A general term describing engineering work involving the vertical and horizontal positioning, adjusting, and refining, as well as comprehensive evaluation of possible connectors through a selected study corridor and considering all relevant features, controls, travel desires, impacts, benefits, and costs. Alignment studies are typically performed to assess the relative feasibility of a proposed transportation facility.

alternative – One of a number of specific transportation-improvement proposals, alignments, options, design choices, and so forth in a defined study area. For a transportation project, alternatives to be studied typically include the No-Build Alternative, an upgrading of the existing roadway alternative, new transportation routes and locations, transportation systems management strategies, multimodal alternatives (if warranted), and any combinations of these.

archaeologically sensitive surficial deposits – Land forms that are likely locations of prehistoric settlements or gathering places, based on a Maine Historic Preservation Commission (MHPC) predictive model that uses surficial geology (i.e., water bodies, alluvium, lake-bottom deposits, glacial outwash, and eskers) to assess sensitivity.

arterials – Roads with high traffic volumes that provide linkage among major cities and towns and developed areas, capable of attracting travel over long distances. Basically, arterials provide service to interstate and

inter-county travel demand. The arterial system typically provides for high travel speeds and the longest trip movements. The degree of access control on an arterial may range from full control (i.e., freeways) to entrance control (e.g., on an urban arterial through a densely developed commercial area).

at-grade – The intersection of two roads, or a road and a railway, that cross at the same elevation.

at-risk watershed – Watersheds contributing to water bodies that are at risk of eutrophication due to new development and phosphorus-laden runoff. These water bodies include public drinking-water supplies and waters that currently exhibit algal blooms or other signs of eutrophication. At-risk watersheds are defined according to criteria in the State of Maine Stormwater Law (5 MRSA § 3331).

attainment area – A geographic area in which levels of a criteria air pollutant meet the health-based primary standard (i.e., National Ambient Air Quality Standard) for the pollutant. Attainment areas are defined using federal pollutant limits set by the U.S. Environmental Protection Agency.

avoidance alternative – A general term used to refer to any alignment proposal that has been developed,

modified, shifted, or downsized to specifically avoid impacting one or more resources.

Beginning with Habitat Program – A collaborative program of federal, state, and local agencies and nongovernmental organizations. It is a habitat-based approach to conserving wildlife and plant habitat on a landscape scale managed by the Maine Department of Inland Fisheries and Wildlife.

Best Management Practices – Structural and/or management practices employed before, during, and after construction to protect receiving-water quality. These practices provide techniques to either reduce soil erosion or remove sediment and pollutants from surface runoff.

biodiversity – The diversity of genes, species, and ecosystems. This term includes the entire hierarchy of ecological organization and encompasses regional ecosystem diversity (i.e., landscape diversity), local ecosystem diversity (i.e., community diversity), species diversity, and genetic diversity within populations of a species.

biological assessment (BA) – the information prepared by or under the direction of the Federal agency concerning listed and proposed species and designated and proposed critical habitat that may be present in the

action area and the evaluation potential effects of the action on such species and habitat.

biological opinion (BO) – the document that states the opinion of the U.S. Fish and Wildlife Service or National Marine Fisheries as to whether or not the Federal action is likely to jeopardize the continued existence of listed species or result in destruction or adverse modification of critical habitat.

carbon monoxide (CO) – A colorless, odorless, tasteless gas formed in large part by incomplete combustion of fuel. Fuel-combustion activities (e.g., transportation, industrial processes, and space heating) are the major sources of CO.

CEQ Regulations – Directives issued by the Federal Council on Environmental Quality, published in 40 CFR 1500-1508, which governs the implementation of the National Environmental Policy Act and the development and issuance of environmental policy and procedure for federal actions by public agencies. The regulations contain definitions, spell out applicability and responsibilities, and mandate certain processes and procedures for state agencies with programs that utilize federal-aid funds.

collector roads – Roads characterized by a roughly even distribution of their access and mobility functions.

These routes gather traffic from local roads and streets and deliver it to the arterial system. Traffic volumes and speeds are typically lower than those of arterials.

comment period – The duration of time during which written comments or responses may be submitted to an agency that has distributed a document for review and comment. It can be applicable to all types of documents that are circulated as well as to formal presentations, such as those that may be given by transportation-department officials at a public hearing.

community water supply – A public water system that serves at least 25 residents throughout the year; consists of one or multiple wells or reservoirs.

conceptual design – idea or feasibility phase of the design process during which various alternatives are developed and tested. During this phase, various environmental and engineering issues are identified and accounted for prior to advancing a range of alternatives into the preliminary and final design phases.

conceptual mitigation – The early, generalized identification of design, operational, construction, or other measures considered to avoid, minimize, or compensate for anticipated environmental consequences. Typically, conceptual mitigation

represents ideas discussed before the concluding stages of an environmental study.

concurrence – Determination by an agency that information to date is adequate and a project can advance to the next stage of project development.

conference – a process which involves informal discussions between a Federal agency and the U.S. Fish and Wildlife Service or National Marine Fisheries under section 7(a)(4) of the Endangered Species Act regarding the impact of an action on proposed species or proposed critical habitat and recommendations to minimize or avoid the adverse effects.

connector – A highway or roadway that connects to another highway or roadway.

construction phase – The phase of the transportation project development process that entails the physical act of building by a contractor of the proposed project according to all plans and specifications developed during final design.

controlled-access facility – A highway where access to abutting properties is restricted or limited by control of the right-of-way.

controlled-access highway – A highway that provides limited points of vehicle access; access is permitted only at interchanges and intersections. Freeways, such as I-395, are controlled-access highways in which access points occur only at interchanges. These highways serve mobility needs and are designed to accommodate higher travel speeds.

cooperating agency – Any organization, other than the lead agency, that has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposed action.

cost effectiveness – An economic measure used to evaluate and compare the corridors of a study. Cost effectiveness is defined as the present value of a gross regional product growth per dollar of construction cost. In this way, cost effectiveness compares the relative future economic benefits to the size of the investment required to generate those benefits.

critical habitat – specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection.

cumulative impacts – Impacts on the environment that result from the incremental impact of a project

when added to other past, present, and reasonably foreseeable future actions regardless of which agency or person undertakes other such actions; required under the National Environmental Policy Act (NEPA) by the Council on Environmental Quality (CEQ).

daily traffic volume – The number of vehicles that use a given roadway in both directions during a 24-hour period.

dB – Decibel, a unit of measurement of sound level. Expresses relative difference in power or intensity, usually between two acoustic or electric signals, equal to 10 times the common logarithm of the ratio of the two levels.

dBA – An abbreviation for A-weighted decibel. A decibel is a unit used to describe sound-pressure levels on a logarithmic scale. For a community noise-impact assessment, an A-weighted frequency filter is used to approximate the way humans hear sound.

deciduous – Refers to woody vegetation, such as oak or maple trees, that shed their leaves after the growing season.

deer-wintering area – Areas of softwood-dominated forest that provide food resources and shelter for deer during severe winter conditions.

demand – Vehicular traffic demand (i.e., volume) on a given highway segment, expressed in vehicles per day.

demand shift – The change in demand (i.e., volume) on a given highway segment, expressed in vehicles per day. Demand shifts can be caused by new corridors that provide a faster and/or shorter travel route.

design hour volume (DHV) – The hour used for geometric design of highways, typically the 30th highest traffic volume of the year.

destruction or adverse modification – a direct or indirect alteration that appreciably diminishes the conservation value of critical habitat for listed species. Such alterations may include, but are not limited to, effects that preclude or significantly delay the development of the physical or biological features that support the life-history needs of the species for recovery.

direct impacts – The immediate effects on the social, economic, and physical environment caused by the construction and operation of a highway. These impacts are usually experienced within the right-of-way or in the immediate vicinity of the highway or another element of the proposed action.

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disadvantaged population – A group of people, living in one area, that has a median income below the federal poverty level or that exhibits other indicators of economic disadvantage.

displacement – The act of removing businesses, people, or households from structures for transportation right-of-ways.

Draft Environmental Impact Statement (DEIS)
– The document prepared by the Federal Highway Administration (FHWA) in accordance with FHWA National Environmental Policy Act regulations (23 CFR Part 771). These regulations require that the DEIS evaluate all reasonable alternatives considered; discuss the reasons that alternatives have been eliminated from detailed study; and summarize the studies, reviews, consultations, and coordination required by environmental laws and Executive Orders.

early coordination – Communication undertaken near the beginning of a transportation-study development process to exchange information and work cooperatively with agencies and the public in an effort to determine the type and scope of studies, level of analysis, and related study requirements.

edge habitat – An area along a transitional zone between two or more vegetation cover types that provide feeding, breeding, nesting, and/or cover habitat for wildlife.

endangered species – Any species that is in danger of extinction throughout all or a significant portion of its range (in reference to the Endangered Species Act [16 USC Chapter 35 Section 3(6)] and the Maine Endangered Species Act).

engineering – A general term that refers to the systematic analysis and development of measurable physical data using applied mathematical, scientific, and technical principles to yield tangible end products that can be made, produced, and constructed.

environment – The complex of social, natural, and cultural conditions that are present in the physical surroundings.

Environmental Assessment (EA) – A document prepared for federal actions that are not categorical exclusions and that do not clearly require an Environmental Impact Statement (EIS). An EA provides the analysis and documentation to determine if an EIS or a Finding of No Significant Impact (FONSI) should be prepared.

environmental baseline – An inventory or summary assessment of environmental features present in a study area, typically conducted during systems planning or early project development. This activity is used to provide environmental-impact information as a basis for developing alternatives.

environmental feature – A general term to denote resources or objects located in or adjacent to an existing or proposed transportation corridor. Features may include natural or physical resources, important structures, community facilities, topographic features, and certain other land uses.

environmental justice – Executive Order 12898 requires each federal agency to “make achieving environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental impacts on minority populations and low-income populations.”

essential fish habitat (EFH) – Those waters and substrate that are necessary to fish for spawning, breeding, feeding, or growing to maturity, as defined by the National Marine Fisheries Service and the regional Fishery Management Councils. EFH is protected by the Magnuson-Stevens Fishery Conservation and Management Act of 1996.

Farmland Protection Policy Act (FPPA) – A statute enacted in 1981 by the U.S. Congress to ensure that significant agricultural lands are protected from conversion to nonagricultural uses. For highway projects receiving federal aid, the regulations promulgated under the FPPA (7 CFR Part 658, 1984) require a state highway authority (i.e., the MaineDOT) to coordinate with the USDA Natural Resources Conservation Service. The FPPA regulates four types of farmland soils: prime farmland, unique farmland, farmland of statewide importance, and farmland of local importance.

farmland soils – Soils suited to producing crops; those with soil quality, growing season, and moisture supply needed to produce a sustainable yield when treated and managed using acceptable methods. Specifically, farmland soils are those soil types designated by the Natural Resources Conservation Service in accordance with the Farmland Protection Policy Act of 1981 by the U.S. Department of Agriculture.

farmland soils of statewide importance – Soils that are nearly prime farmland and that produce high yields of crops when treated and managed according to acceptable farming methods (see the definition for prime farmland soil).

feasibility study – A general term that refers to various types of systematic evaluations carried out to better assess the desirability or practicality of further developing a proposed action. Such studies are typically performed during the planning stages.

federal-aid system – The federal-aid system consists of those routes in Maine that are eligible for the categorical federal highway funds.

Federal Emergency Management Agency (FEMA) – A former independent agency that became part of the new Department of Homeland Security in March 2003. It is tasked with responding to, planning for, recovering from, and mitigating against disasters.

Federal Highway Administration (FHWA) – The branch of the U.S. Department of Transportation responsible for administering the funding of federal-aid highway projects.

Federal Register – A daily publication of the U.S. Government Printing Office that contains notices, announcements, rulemaking, and other official pronouncements of the administrative agencies of the U.S. Government. Various announcements and findings related to specific environmental matters and

transportation projects and activities appear in this publication.

final design phase – The phase of the transportation project development process that involves the preparation of detailed working drawings as well as specifications and estimates for approved transportation projects.

Final Environmental Impact Statement (FEIS) – The document prepared after circulation of a DEIS (or Supplemental DEIS) and consideration of comments received. The Federal Highway Administration National Environmental Policy Act regulations (23 CFR Part 771.125) require that the FEIS identify a preferred alternative, evaluate all reasonable alternatives considered, discuss and respond to substantive comments on the FEIS, summarize public involvement, and describe the mitigation measures that will be incorporated into the proposed action.

Finding of No Significant Impact (FONSI) – A document by a federal agency that briefly presents the reasons why an action, not otherwise excluded (§ 1508.4), will not have a significant effect on the human environment and, therefore, for which an environmental impact statement will not be prepared. It will include the environmental assessment or a summary of it and

will note any other environmental documents related to it (§ 1501.7(a)(5)). If the assessment is included, the finding need not repeat any of the discussion in the assessment but may incorporate it by reference.

floodplain – The level area adjoining a river channel that is inundated during periods of high flow.

floodway – The channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 100-year flood may be carried without substantial increases in flood heights.

formal consultation – a process between the specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection and the Federal agency that commences with the Federal agency's written request for consultation under section 7(a)(2) of the Endangered Species Act and concludes with the U.S. Fish and Wildlife Service's or National Marine Fisheries's issuance of the biological opinion under section 7(b)(3) of the Act.

fragmentation – Subdivision of a forest or other habitat into isolated patches by roads, land-clearing, or other human or natural alterations of the landscape and

accompanied by the loss of a certain portion of the original habitat.

freeway – A type of road designed for safer high-speed operation of motor vehicles through the elimination of at-grade intersections. This is accomplished by preventing access to and from adjacent properties and eliminating all cross traffic through the use of grade separations and interchanges.

functional conflict – Highways provide a balance between providing access (with multiple access points) and mobility (with controlled-access points). Freeways are designed to maximize mobility and serve regional traffic demands as opposed to local roads (or collectors) that provide multiple access points to adjacent land uses (residences or businesses). Functional conflicts arise when regional traffic that would be better served on a freeway uses local roads.

Geographic Information System (GIS) – A computer-based application used to perform spatial analysis.

geometric deficiency – A deficiency that occurs when a highway's geometric characteristics (e.g., lane width, shoulder width, horizontal curvature, and vertical grade) do not meet prevailing design standards.

geometric design – Those engineering activities that involve standards and procedures for establishing the horizontal and vertical alignment and dimensions of a highway.

glacial outwash – Surficial sand and gravel sediments deposited ahead of a glacier by glacial meltwater.

grade – The slope of a road along the direction of travel, typically characterized by the vertical rise per unit of longitudinal distance.

grade separation – The intersection of two roads, or a road and a railway, that cross at different elevations. One roadway overpasses or underpasses the other roadway with a structure(s).

gross regional product (GRP) – One of the major economic indices of the socioeconomic development of a region. GRP is equal to the total of added values in the regional economic industries, estimated as a difference between production and intermediate consumption.

Groundwater Recharge Protection Areas – Areas of land designated by water-resource agencies through which rainwater or snowmelt percolate and replenish the underlying aquifer near a public well. These areas require special protection because they directly affect

the quality and safety of the public drinking-water supply.

habitat block – Units of habitat uninterrupted by roadways or other disturbances.

high crash location (HCL) – An intersection or highway segment that experiences an abnormally high number of crashes relative to the traffic demands that are served. For the state of Maine, the MaineDOT identifies HCLs.

highway reconstruction/rehabilitation – Reconstruction of an existing highway is undertaken when the pavement structure or alignment of the existing facility is deficient. Reconstruction includes removal and replacement of the entire pavement structure, significant changes in the vertical or horizontal alignment, or addition of lanes. Rehabilitation includes resurfacing and other minor repairs intended to extend the service life of the existing facility and enhance highway safety.

historic resources – Properties, structures, and districts that are listed in or have been determined to be eligible for listing on the National Register of Historic Places.

hourly traffic volume – The number of vehicles that use a given road during a 1-hour period.

hydric soils – Soils that are saturated, flooded, or ponded long enough during the growing season to develop at least temporary conditions in which there is no free oxygen in the soil around roots. Hydric soils correspond to federally and state-regulated wetlands in many circumstances.

hydrologic regime – The frequency and duration of inundation or soil saturation of a given area.

impacts – A term used to describe the positive or negative effects on the natural or human environment as a result of a specific project(s).

impervious surface – Relates to hydrology; a surface through which precipitation cannot penetrate, causing direct runoff or perching (e.g., asphalt paving, roofs, and densely compacted gravel).

incidental take – takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant.

independent utility – The ability of a transportation improvement to be a usable and reasonable expenditure even if no additional transportation improvements are made in the area.

indirect effects (or secondary impacts) – Effects caused by a given action occurring later in time or farther removed in distance but that are reasonably foreseeable (e.g., induced changes to land-use patterns, population density, and growth rate).

Integrated Transportation Decision-Making (ITD) Process – The requirements of Maine’s Sensible Transportation Policy Act and the National Environmental Policy Act have been integrated within a single ITD process to guide the planning of new transportation construction projects in the state.

Intelligent Transportation Systems (ITS) – The application of technology to goods and people movement to reduce delay and improve safety. The main applications of ITS in place today involve the monitoring of real-time traffic flows and weather conditions and then transmitting this information to the appropriate authorities and the motoring public. The authorities use this information to send response teams to the scene of an accident, whether it is an emergency medical team or a hazardous material team. The motoring public is alerted to potential hazards or delays on roadways through the use of highway advisory radio, variable message signs, or broadcast radio traffic reports.

interagency meeting – One of several scheduled gatherings held during the transportation project development process to present studies and data to government agencies and to receive comments and responses to assist in further project development. Typically, these meetings are held to discuss data such as plans of study, needs analyses, alternatives-analysis information, elimination and selection of alternatives, and environmental documents.

Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) – a United States federal law that posed a major change to transportation planning and policy, as the first U.S. federal legislation on the subject in the post-Interstate Highway System era. It presented an overall intermodal approach to highway and transit funding with collaborative planning requirements, giving significant additional powers to metropolitan planning organizations. Signed into law on December 18, 1991 by President George H. W. Bush, it expired in 1997. It was followed by the Transportation Equity Act for the 21st Century (TEA-21) and most recently in 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).

interstate – A freeway-type highway that is part of the National Highway System.

Interstate Highway System – The network of interstate highways established by the Federal-Aid Highway Act of 1956. The statute established a 41,000-mile network of controlled-access highways (expanded to 42,000 miles by legislation in 1968) intended to connect all metropolitan areas with populations of more than 50,000 and all state capitals.

jeopardize the continued existence of – to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.

Labor Market Area (LMA) – Regional areas with a high concentration of employment opportunities. These are economically integrated units within which workers may readily change jobs without changing their place of residence.

lacustrine – Of and related to lakes.

Land and Water Conservation Fund (LWCF) – A system for funding federal, state, and local parks and conservation areas, created by the Land and Water Conservation Fund Act of 1964.

lead agency – The federal project proponent with primary responsibility for preparing an environmental document.

Least Environmentally Damaging Practicable Alternative (LEDPA) – This is identified by the U.S. Army Corps of Engineers in compliance with Section 404(b)(1) of the U.S. Clean Water Act. Critical to the selection of the LEDPA is the recognition of the full range of National Environmental Policy Act alternatives and impacts in determining which alternatives are (1) practicable, and (2) environmentally less damaging. The U.S. Army Corps of Engineers is the only federal agency that can permit the LEDPA.

legal notice – A formal announcement or finding published in a periodical or newspaper to provide official public notice of an action or approval that is of public interest.

level of detail – A general term referring to the amount of data collected and the scale, scope, extent, and degree to which item-by-item particulars and refinements of specific points are necessary or desirable in carrying out a study. Level of detail is an important factor in the quality of a study, overall study costs, and length of time needed to perform study work.

Level of Service (LOS) – A qualitative measure describing operational conditions in a traffic stream and their perception by motorists and/or passengers. Six levels of service are defined and given letter designations from A to F, with LOS A representing the best operating conditions (i.e., very light, free-flowing traffic) and LOS F the worst (i.e., congested, stop-and-go traffic).

link – A new or existing highway segment between two defined end-points.

local roads and streets – All public roads and streets not classified as arterials or collectors have a local classification. Local roads and streets are characterized by many points of direct access to adjacent properties and have a relatively minor role in accommodating mobility. Speeds and traffic volumes are usually low.

logical termini – Features such as cross-route locations that are considered rational end-points for a transportation improvement and that serve to make it usable.

Magnuson-Stevens Fishery Conservation and Management Act – Legislation (16 USC 1855(b)) governing all fisheries resources within 320 kilometers (200 miles) of the U.S. coast that established regional

Fishery Management Councils and required the preparation of Fisheries Management Plans.

MaineDOT Highway Design Guide – A tool developed by the MaineDOT that provides guidance for the design of roads and highways in the State of Maine in addition to the Federal Highway Administration design criteria.

Maine Sensible Transportation Policy Act (STPA) – A state law enacted in 1991 by the citizens of Maine that provides a decision-making framework for examining a range of alternatives. The STPA is applicable to transportation-planning, capital-investment, and project-selection decisions made by the MaineDOT.

major collector road – Collector roads that tend to serve higher traffic volumes than other collector roads. Major collector roads typically link arterials. Traffic volumes and speeds are typically lower than those of principal arterials.

mesoscale air-quality analysis – A regional-level analysis of air for chemical constituents.

microscale air-quality analysis – An analysis of air for chemical constituents, typically conducted for a small study area such as an intersection.

minor arterial – Highways that tend to link collector roads to principal arterials and serve lower traffic volumes than typical arterials. Minor arterials are typically designed at lower travel speeds than principal arterials.

mitigation – Actions that avoid, minimize, or compensate for potential adverse impacts.

mitigation measures – Specific design, commitment, or compensation made during the environmental evaluation and study process that serve to moderate or lessen impacts from a proposed action. In accordance with CEQ Regulations, mitigation includes avoidance, minimization, rectification, reduction, and compensation.

National Ambient Air Quality Standards (NAAQS) – The prescribed level of pollutants in the outside air that cannot be exceeded during a specified time in a specified geographic area.

National Environmental Policy Act (NEPA) of 1969, as amended – Federal legislation that requires an interdisciplinary approach in planning and decision making for federal-aid actions. The Act includes requirements for the contents of Environmental Impact Statements that are to accompany every recommendation for major

federal actions significantly affecting the quality of the human environment. The interdisciplinary study approach includes analysis of potential impacts to the natural, social, and economic environments.

National Highway System (NHS) – A system of those highways determined to have the greatest national importance to transportation, commerce, and defense in the United States. It consists of the Interstate Highway System and logical additions to it, selected other principal arterials, and other facilities that meet the requirements of one of the NHS subsystems.

National Historic District – An area consisting of numerous buildings and their settings and identified as historic on the National Register of Historic Places.

National Priority List (NPL) – The “Superfund” statute (42 USC Section 9601) requires the U.S. Environmental Protection Agency to establish a NPL of sites that are to be given top-priority consideration for removal of hazardous substances and remedial action.

National Register of Historic Places (NRHP) – the official list of the Nation’s historic places worthy of preservation. Authorized by the National Historic Preservation Act of 1966, the National Park Service’s National Register of Historic Places is part of a national

program to coordinate and support public and private efforts to identify, evaluate, and protect America’s historic and archeological resources.

National Wetlands Inventory (NWI) – A program administered by the U.S. Fish & Wildlife Service for mapping and classifying wetlands resources in the United States.

Natural Resources Conservation Service (NRCS) – Formerly the Soil Conservation Service, NRCS is a department in the U.S. Department of Agriculture responsible for conserving all natural resources on private lands and administering the Farmland Protection Policy Act.

needs analysis – Data collection and analysis to document the purpose and needs for a project. This document may draw on any number of transportation, master-planning, socioeconomic, traffic, safety, system-linkage, growth-management, or other community or regional issues of importance.

new location highway – A highway proposed to be constructed on land not currently used for transportation facilities.

nitrogen oxides (NO_x) – Nitric oxide (NO) and nitrogen dioxide (NO₂) are collectively referred to as nitrogen oxides (NO_x). NO forms during the high-temperature combustion process. NO₂ forms when NO further reacts in the atmosphere. NO_x reacts with sunlight to form ozone, a colorless gas associated with smog or haze conditions. Ozone is a pollutant regulated by the Clean Air Act Amendments of 1990.

No-Build Alternative – Typically includes short-term, minor restoration types of activities (e.g., safety and maintenance improvements) that maintain the continuing operation of an existing facility. The No-Build Alternative serves as a baseline for the comparison of other alternatives.

noise abatement criteria (NAC) – Noise levels measured in decibels that are used as a basis of comparison for evaluating the impact from predicted design-year noise and for determining whether noise-abatement measures should be considered.

noise abatement measures – Actions that reduce traffic-noise impacts. Noise-abatement measures can be traffic-management measures, alteration of horizontal and vertical alignments, acquisition of property rights for construction of noise barriers, construction of noise barriers, acquisition of real property or interest

for buffer zones, or noise insulation of public-use or nonprofit institutional structures.

noise receptor – Locations that may be affected by noise. Sensitive receptors include residences, parks, schools, churches, libraries, hotels, and other public buildings.

non-community drinking water system – A public water system that serves at least 25 people at least 60 days of the year and is not a community or seasonal water system.

non-point source pollution (NPS) – Pollution of water bodies that does not originate at a single specific source, such as an industrial discharge or discharge from a wastewater treatment plant. Sources of NPS include runoff from highways, agricultural fields, golf courses, and lawns.

other principal arterials – Highways that provide access between arterials and a major port, airport, public-transportation facility, or other intermodal-transportation facility. Other principal arterials tend to serve lower traffic demands than principal arterials.

Outstanding River Segment (ORS) – A section of a river or stream designated by the Maine Natural

Resources Protection Act (12 MRSA § 403) for protection because of the special resource values of its flowing waters and shorelines.

ozone – A gas that is a variety of oxygen. Ozone is a pollutant regulated by the Clean Air Act Amendments of 1990. Ground-level ozone is the main component of smog. Ozone is not directly emitted by motor vehicles but rather is formed when oxides of nitrogen react with sunlight.

palustrine – The group of vegetated wetlands traditionally called by names such as marsh, swamp, bog, fen, and prairie. Palustrine wetlands may be situated shoreward of lakes, river channels, or estuaries; on river floodplains; in isolated catchments; or on slopes.

palustrine emergent wetlands (PEM) – A palustrine wetlands dominated by herbaceous species, typically cattails, sedges, and grasses, and commonly referred to as a marsh.

palustrine forested wetlands (PFO) – A palustrine wetlands dominated by trees, commonly referred to as a swamp.

palustrine scrub-shrub wetlands (PSS) – A palustrine wetlands dominated by shrubs.

peak hour – The hour of the day when traffic volume on a given roadway is highest. A separate peak hour can be defined for morning and evening periods.

peak-hour Leq – Represents the noisiest hour of the day/night and usually occurs during peak periods of motor-vehicle traffic. The Leq is the equivalent sound-level measurement, which means it averages background and short-term transient sound levels and provides a uniform method for comparing sound levels that vary over time.

peak-hour volume – The traffic volume that occurs during the peak hour, expressed in vehicles per hour. Peak-hour volumes are typically 10 to 15 percent of daily volumes.

permit – Written permission given by a governmental agency to take certain action during specific steps of a transportation project development process. Permits may include permission for any construction, excavation, depositing of material, or other work in navigable waters (USACE); permission required for the discharge of dredged or fill material into waters of the United States (USACE); and permission to construct

bridges, causeways, and drawbridges in navigable waters (U.S. Coast Guard). A permit also may refer certain other clearances or certifications, such as clearance from the Federal Aviation Administration for proposed highway construction in the vicinity of public-use and military airports, and water-quality certifications for the licensing of an action that would result in a discharge into regulated waters. These approvals, as well as certain others relating to solid-waste management, underground storage tanks, coastal zone areas, and so forth, involve approvals and documentation commonly referred to as permits.

plan of study – A detailed, item-by-item outline of the objectives, scope, methodology, and schedules for the analysis and development of a specific transportation project.

posted speed limit – The speed posted for a facility based on engineering and traffic investigations.

preliminary engineering – A general term to describe early phases of technical studies undertaken to determine all relevant aspects of transportation location, to identify feasible route alternatives or design options, and to assess various cost and benefit parameters before advancing the project into more detailed final design.

prime farmland soil – Soil map units that are designated by the Natural Resources Conservation Service as having the properties needed to produce sustained high-yield crops when managed with modern farming techniques.

principal arterials – Highways in rural and urban areas that connect urban areas, international border crossings, major ports, airports, public-transportation facilities, or other intermodal-transportation facilities.

project development – The overall process of advancing a transportation project from concept to implementation. Project development typically encompasses environmental and engineering tasks including planning, location, preliminary design, final design, and construction.

proposed species – any species of fish, wildlife, or plant that is proposed in the Federal Register to be listed under section 4 of the Endangered Species Act.

public hearing – A meeting designed to afford the public the fullest opportunity to express opinions on a transportation project. A verbatim record (i.e., transcript) of the proceedings is made part of the project record.

public involvement – Activities that present information to the public, seek public comments, and serve to ensure consideration of public opinion.

public meeting – An announced meeting conducted by transportation officials designed to facilitate participation in the decision-making process and to assist the public in gaining an informed view of a proposed project at any level of the transportation project development process. Such a gathering may be referred to as a public information meeting.

rare and exemplary natural community – An assemblage of interacting plants and animals and their common environment, recurring across the landscape, in which the effects of recent human interference are minimal. Rare natural communities are those that occur infrequently. Exemplary natural communities are exceptional representatives of more common natural communities.

RCRA generator – An entity that produces hazardous waste regulated under the Resource Conservation and Recovery Act (RCRA) (42 USC Section 6901), which mandates the appropriate identification, tracking, and disposal of hazardous waste.

Record of Decision (ROD) – The document, prepared by the Federal Highway Administration, that presents the basis for the federal-agency action, summarizes any mitigation measures to be incorporated, and documents any required Section 4(f) approvals. No federal-agency action may be undertaken until a ROD has been signed. A ROD is prepared no sooner than 30 days after the public release of the Final EIS (FEIS).

relocations – The displacement of a residence, business, or other structure from a property owner, for public use, that requires the residents or business to be moved to an alternate location.

right-of-way – Land acquired by purchase, gift, or eminent domain to build and maintain a public road, bridge, railroad, or public utility.

riparian – An area of land that is adjacent to a stream or other water body.

riverine – Of and relating to rivers.

rural – A rural community is defined as an area with a population of fewer than 2,500 people or a population between 2,500 and 6,000 people and a worker-to-resident-worker ratio less than 1.0.

safety deficiency – In the context of this study, a safety deficiency is a highway segment or intersection that contains a high crash location.

Section 4(f) of the U.S. Department of Transportation Act of 1966 (49 USC Section 303) (Section 4(f)) – Legislation protecting publicly owned parks, public recreation areas, historic properties, or wildlife and waterfowl refuges. The statute states that no Department of Transportation project may use land from these areas unless it has been demonstrated that there is to be no prudent and feasible alternative to using the land and that the project includes all possible planning to minimize harm resulting from the use.

Section 6(f) of the Land and Water Conservation Fund Act of 1963 (Section 6(f)) – Legislation that provides for the public purchase and preservation of tracts of land.

Section 10 of the Rivers and Harbors Act of 1899 (Section 10) – Legislation (33 USC Section 403) that resulted in a permit being required from the U.S. Army Corps of Engineers (USACE) for projects requiring construction in or over navigable waters, the excavation from or dredging or disposal of materials in such waters, or any obstruction or alteration in a navigable water (e.g., stream channelization).

Section 106 of the National Historic Preservation Act (Section 106) – The National Historic Preservation Act of 1966 (16 USC 470f), Section 106, requires federal agencies to consider the effect of their undertakings on properties included in or eligible for inclusion on the National Register of Historic Places and to afford the Advisory Council on Historic Preservation the opportunity to comment on such undertakings.

Section 404 of the Clean Water Act (Section 404) – The Federal Water Pollution Control Act Amendments of 1972 (33 USC 401 et seq.) is the legislation for protection of waters of the United States by the USACE and the U.S. Environmental Protection Agency. In accordance with Section 404 of the Clean Water Act, a permit is required from the USACE for projects requiring discharge of dredged or fill material into waters of the United States.

shrub – A woody plant of relatively low height, having several stems arising from the base and lacking a single trunk.

sight distance – The distance that a driver can see along the roadway before curvature or obstructions block the view.

significant impacts – Any number of social, environmental, or economic effects or influences that may occur as a result of the implementation of a transportation improvement. “Significant impacts” may include effects that are direct, secondary, or cumulative. The term *significant* is used to measure both context and intensity and interpreted by the Federal Highway Administration in determining what type of National Environmental Policy Act document is appropriate. Categorical exclusions are those actions that do not involve significant effects. In most cases, Environmental Impact Statement projects can and do involve significant impacts.

significant wildlife habitat – as defined by Maine Law – Wildlife habitats, including deer-wintering yards, waterfowl and wading-bird habitat, seabird-nesting habitat, and significant vernal pools, that are protected under the State of Maine’s 38 MRSA § 480-B.

State Implementation Plan (SIP) – A plan created under the 1990 Clean Air Act Amendments that establishes emission-reduction requirements for ozone and carbon-monoxide nonattainment areas. Proposed projects must demonstrate that the impacts of emissions are consistent with the appropriate SIP.

Stormwater Pollution Prevention Plan (SWPPP) – A plan required for major construction projects under the U.S. Environmental Protection Agency National Pollutant Discharge and Elimination System general permit for construction activities. The SWPPP is required to address measures to prevent erosion, sedimentation, and other potential discharges of pollutants to water bodies and wetlands.

stormwater runoff – The portion of precipitation that flows toward stream channels, lakes, or other water bodies as surface flow.

study area – An identified expanse of land or topography selected and defined at the outset of engineering or environmental evaluations that is sufficiently adequate in size to fully identify, analyze, and document impacts and effects for proposed projects within its boundaries.

study need – A detailed explanation of the specific transportation problems or deficiencies that have generated the search for improvements. It refers to technical information, as necessary, such as measures of traffic efficiency or demand (e.g., origin–destination patterns, modal links, queue lengths, motorist delays, and level of service) and other goals (e.g., economic development, safety improvement, and legislative directives). Much of this information should be

generated by the transportation planning process at an early stage. The explanation of need should be a problem-statement discussion, not a solution-oriented discussion.

study purpose – A broad statement of the overall intended objective to be achieved by a proposed transportation facility. Typically, the purpose can be defined in a few sentences. For instance, it may address expanded capacity in a given transportation corridor to facilitate the safe and efficient movement of people and goods or improved access to a given area or community.

Supplemental Draft Environmental Impact Statement (SDEIS) – The document prepared by the Federal Highway Administration (FHWA) in accordance with FHWA National Environmental Policy Act regulations (23 CFR Part 771.130). A DEIS will be supplemented when the FHWA determines that (1) changes to the proposed action would result in significant impacts not evaluated in the DEIS, or (2) new information or circumstances relevant to environmental concerns and bearings on the proposed action or its impacts would result in significant environmental impacts not evaluated in the DEIS. An SDEIS document generally presents new and updated information with regard to changes in the study and environment that have occurred since the publication of a DEIS.

Surface-water supply watershed – The watershed that contributes to a public drinking-water supply.

system compatibility – Describes how well alternatives, either new highways or upgrades, fit into an existing highway network and the transportation-improvement plan.

system continuity – Defined by how often highways transition between wide, higher-speed segments to narrow, lower-speed segments.

system linkage – A planning concept that refers to the interconnecting of roadways that comprise an overall transportation network. A discussion about how a proposed project fits into an existing and future transportation system (i.e., network) and how it contributes to developing a sound transportation network in an area or region is termed *system linkage*. In describing this concept, the terms *connector road*, *missing link*, *gap completion*, and *circumferential link* are sometimes used.

system planning – A methodical approach to the formulation of plans and programs for safe, efficient, and balanced transportation networks. The process includes the setting of goals and objectives; the collection of data of existing conditions; the simulation of future activities; the formulation of alternative planned changes; the

evaluation of the changes against the desired goals and objectives; and the decisions about recommendations that are feasible, desirable, and appropriate.

threatened species – Any species that is likely to become an endangered species in the foreseeable future throughout all or a significant portion of its range (in reference to the Endangered Species Act [16 USC. Chapter 35 Section 3(20)] and the Maine Endangered Species Act).

Traditional Cultural Property (TCP) – A property or site that is eligible for inclusion on the National Register of Historic Places because of its association with cultural practices or beliefs of a living community that are rooted in that community's history and are important to maintaining the continuing cultural identity of the community.

transportation deficiencies – A highway-related facility that is unable to safely and efficiently satisfy travel demands because of the intensity of traffic volumes, capacity, and/or safety.

Transportation Demand Management (TDM) – A system of actions whose purpose is to alleviate traffic problems through improved management of vehicle trip demand as opposed to adding new highway segments.

transportation project development process – An interactive, multiphase series of activities typically spanning a period of years that involves comprehensive planning, prioritization, detailed engineering and environmental studies, and agency and public involvement that lead to the selection, design, and construction of identified transportation improvements.

Transportation Systems Management (TSM) – Relatively low-cost measures to increase capacity and/or provide safety improvements on an existing transportation system. These measures typically include traffic-signal timing or phasing adjustments, designation of turning lanes at specific intersections or driveways, access-management improvements, and enhanced signage or markings.

unfragmented habitat block – An undeveloped area that is not impacted by roads, vegetation clearing, or development.

upgrade – A geometric improvement to an existing highway segment.

urban – An urban community is defined as an area with a population of more than 7,500 people or a population

between 2,500 and 7,500 people and a worker-to-resident-worker ratio greater than 1.0.

U.S. Army Corps of Engineers (USACE) – A federal agency that administers Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. Its regulatory programs address wetlands and waterways protection.

U.S. Department of Agriculture (USDA) – A federal agency responsible for administering programs that address farming issues.

U.S. Environmental Protection Agency (USEPA) – A federal agency responsible for administering programs that address environmental issues.

U.S. Fish & Wildlife Service (USFWS) – A federal agency responsible for addressing the protection of fish and wildlife including rare, threatened, or endangered species. The USFWS has an advisory role in the Section 404 regulatory program administered by the U.S. Army Corps of Engineers.

vegetation cover type – A biological community characterized by certain vegetation characteristics, such as hardwood forest, mixed forest, shrub, herbaceous, and urban or residential managed vegetation.

vehicle-hours traveled (VHT) – A measure of automobile use and trip time. One vehicle traveling 1 hour constitutes 1 vehicle-hour.

vehicle-miles traveled (VMT) – A measure of automobile use and trip length. One vehicle traveling 1 mile constitutes 1 vehicle-mile.

vernal pool – A temporary pool of surface water that provides breeding habitat for certain amphibian and invertebrate species.

volatile organic compounds (VOCs) – Colorless gaseous compounds originating, in part, from the evaporation and incomplete combustion of fuels. In the presence of sunlight, VOCs react to form ozone, a pollutant regulated by the Clean Air Act Amendments.

volume to capacity ratio (v/c) – A measure of traffic demand on a roadway (expressed as volume, “v”) compared to its traffic-carrying capacity (expressed as capacity, “c”). For example, a v/c ratio of 0.7 indicates that a roadway is operating at 70 percent of its capacity.

waterfowl and wading bird habitat (WWH) – Wetlands that provide habitat for waterfowl (i.e., geese, brant, and ducks) and wading birds (i.e., heron, egrets, bitterns, and rails) and meet certain criteria for size, quality, and

percentage of open water as established by the Maine Department of Inland Fisheries and Wildlife regulations.

watershed – A region or area that contains all land ultimately draining to a water course, body of water, or aquifer.

wellhead protection area (WPA) – Areas of land in which human activities are regulated to protect the quality of groundwater that supplies public drinking-water wells.

wetlands – Areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support – and that under typical circumstances do support – a prevalence of vegetation typically adapted for life in saturated soil conditions.

wild and scenic river – A river or river segment designated by an act of Congress, State or States through which they flow, and approved by the U.S. Department of the Interior, because of the outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values (16 USC 1271-1287).

Acronyms

AADT	Average annual daily traffic	GOM	Gulf of Maine
ac.	Acre	HCL	High crash location
BO	Biological Opinion	ITS	Intelligent transportation systems
BA	Biological Assessment	IWWH	Inland waterfowl and wading bird habitat
CAA	Clean Air Act	LEDPA	Least environmentally damaging practicable alternative
CFR	Code of Federal Regulations	Leq(h)	One-hour equivalent sound level
CO	Carbon monoxide	LOS	Level of service
CRF	Critical Rate Factor	MaineDOT	Maine Department of Transportation
CWA	Clean Water Act (U.S.)	MASC	Maine Atlantic Salmon Commission
CZM	Coastal Zone Management	MCP	Maine Coastal Program
CZMA	Coastal Zone Management Act	MDEP	Maine Department of Environmental Protection
dBA	Decibels using an A-weighted frequency filter	MDIFW	Maine Department of Inland Fisheries and Wildlife
DEIS	Draft environmental impact statement	MDMR	Maine Department of Marine Resources
DHV	Design hour volume	MDOC	Maine Department of Conservation
DPS	Distinct population segment	MHPC	Maine Historic Preservation Commission
EA	Environmental assessment	MNAP	Maine Natural Areas Program
EFH	Essential fish habitat	mph	Miles per hour
EIS	Environmental impact statement	MPO	Metropolitan Planning Organization
ESA	Endangered Species Act (U.S.)	MRSA	Maine Revised Statutes Annotated
FEMA	Federal Emergency Management Agency	MSAT	Mobile source air toxics
FHWA	Federal Highway Administration	NAAQS	National Ambient Air Quality Standards
FEIS	Final environmental impact statement	NCHRP	National Cooperative Highway Research Program
FPPA	Farmland Protection Policy Act (U.S.)		

NAC	Noise abatement criteria	SO₂	Sulfur dioxide
NEPA	National Environmental Policy Act	STPA	Maine Sensible Transportation Policy Act
NHS	National Highway System	TNM	Traffic Noise Model
NMFS	National Marine Fisheries Service	TSM	Transportation systems management
NO_x	Nitrogen Oxide	USACE	U.S. Army Corps of Engineers
NRCS	Natural Resources Conservation Service	USDA	U.S. Department of Agriculture
NRPA	Natural Resources Protection Act	USEPA	U.S. Environmental Protection Agency
NSA	Noise sensitive area	USFWS	U.S. Fish and Wildlife Service
NWI	National Wetlands Inventory	USGS	U.S. Geological Survey
PAC	Public Advisory Committee	v/c	Volume to capacity ratio
Pb	Lead	VOCs	Volatile organic compounds
PM	Particulate matter	VHT	Vehicle hours traveled
ROD	Record of decision	VMT	Vehicle miles traveled

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Chapter 1

Purpose and Needs

Chapter 1 details the underlying purpose and needs to which the project's sponsors are responding with alternatives in Chapter 2. Chapter 1 provides an overview of the decision makers and decision-making process and provides a foundation for the remainder of the document.

1.1 Introduction

Maine Department of Transportation (MaineDOT) and Federal Highway Administration (FHWA) have undertaken the I-395/Route 9 transportation study to identify a regional solution that would improve transportation-system linkage, safety, and mobility between I-395 and Route 9 in southern Penobscot County, Maine.

The study area is located east of the City of Bangor and I-95 (exhibit 1.1). The City of Brewer and the Towns of Holden and Eddington comprise the majority of the study area. Small portions of the town of Clifton and the town of Dedham in Hancock County are also in the study area. The study area is generally bounded by the Penobscot River to the west, Route 1A to the

south, Route 9 to the north, and Route 46 to the east, encompassing approximately 54 square miles.

The greater Bangor area is the economic and employment center for the north-central Maine region and a center for goods movement because of its proximity to the Interstate system and Canadian markets.

The opening of I-395, the State of Maine's east-west highway initiative, and the creation of the federal National Highway System (NHS) established the impetus for this study (see DEIS section 1.1 Study History).

1.2 Study Purpose

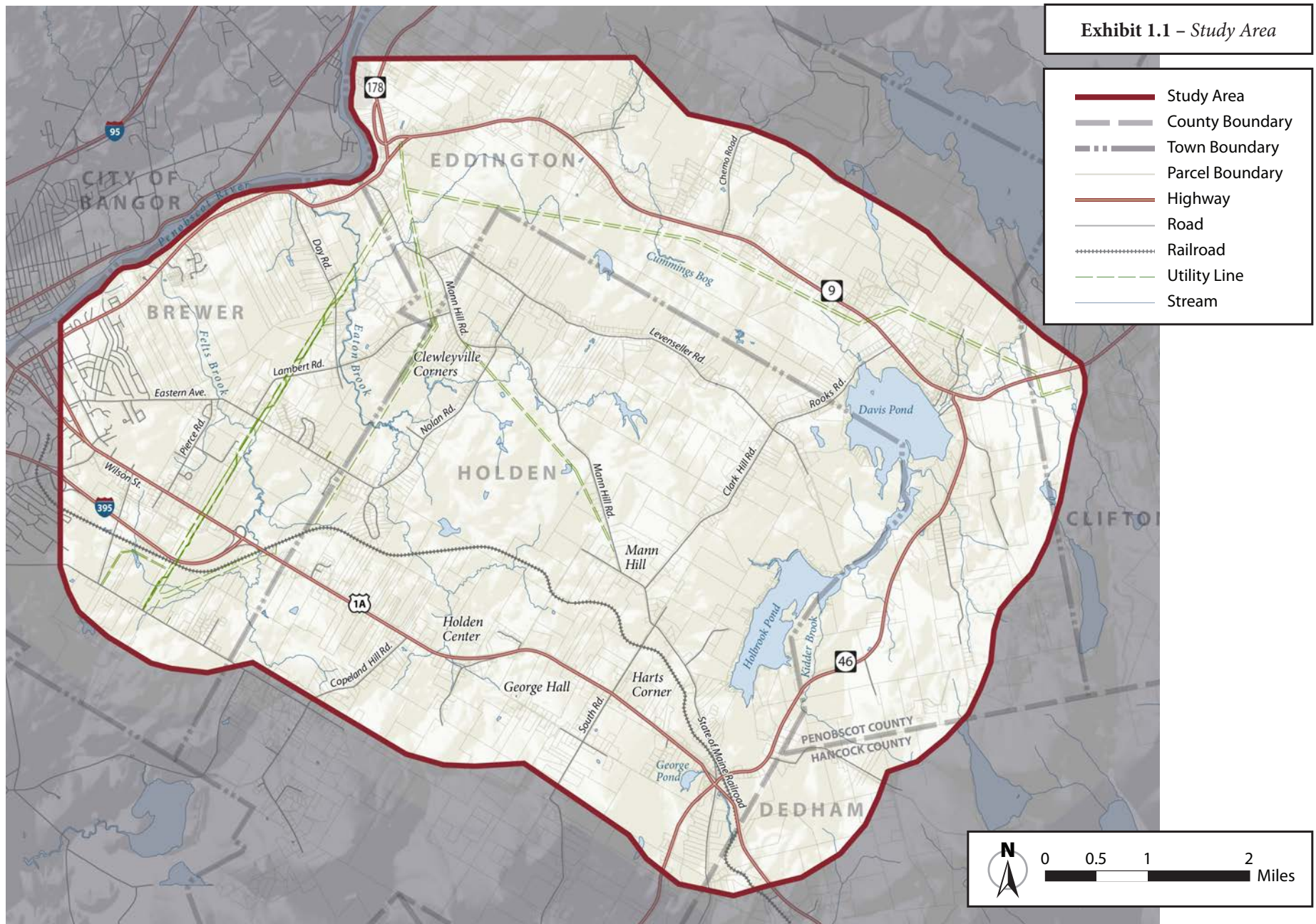
A detailed description of the study purpose and needs was presented in the Draft Environmental Impact Statement (DEIS) Chapter 1 Purpose and Need, which has been incorporated by reference into this Final Environmental Impact Statement (FEIS).

The purposes of the I-395/Route 9 Transportation Study are to (1) identify a section of the NHS in Maine from I-395 in Brewer to Route 9 in Eddington, consistent with the current American Association of State Highway and Transportation Officials (AASHTO)

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- 1.1 Introduction
- 1.2 Study Purpose
- 1.3 Study Need
- 1.4 Federal and State Decisions and Actions
- 1.5 Applicable Regulations, Guidance, and Required Permits and Approvals

I-395/Route 9 Transportation Study Environmental Impact Statement



A Policy on Geometric Design of Highways and Streets; (2) improve regional system linkage; (3) improve safety on Routes 1A and 46; and (4) improve the current and future flow of traffic and the shipment of goods to the interstate system.

The logical termini of the project was identified and defined as (1) I-395 near Route 1A and (2) the portion of Route 9 in the study area.

The segment of highway connecting I-395 to Route 9 would have independent utility; Route 9 would continue to operate with sufficient capacity and at virtually the same operating speed without the need for improvement.

In compliance with Section 404 of the Clean Water Act (CWA), the U.S. Army Corps of Engineers (USACE) is required to prepare a basic purpose statement to determine compliance with the 404(b) (1) guidelines. Accordingly, the USACE determined that the basic project purpose "...is to provide for the safe and efficient flow of east-west traffic and shipment of goods from Brewer (I-395) to Eddington (Route 9), Maine, for current and projected traffic volumes."

In support of this study, a public advisory committee (PAC) was assembled. The PAC consisted of volunteer citizens who are representatives of city and towns in the study area and the adjoining areas. The role of the PAC is to meet periodically throughout the study to review and comment on the activities and work performed and

General Requirements for a Discussion of Purpose and Needs in an Environmental Impact Statement

- The requirement for a discussion of purpose and needs in an Environmental Impact Statement is to "briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action." (40 Code of Federal Regulations [CFR]1502.13)
- The purpose and needs section is in many ways the most important part of a study and chapter of an EIS :
 - » It establishes why agencies are proposing to spend potentially large amounts of money while at the same time causing environmental impacts.
 - » A clear, well-justified purpose and need section explains that the expenditure of money is necessary and worthwhile and the priority that the action resulting from the study would be given relative to other needed highway projects.
 - » Although environmental impacts are expected to be caused by the project implemented resulting from the study, the purpose and needs section should justify why impacts are acceptable based on the project's importance.
- The discussion of purpose and needs should be as concise and understandable as possible. This discussion, which can be as short as one or two paragraphs, is important for general context and understanding, as well as to provide the framework in which "reasonable alternatives" to the proposed action would be identified. The discussion does not include a description of alternatives.

The purpose should be stated in only a few sentences.

Section 404 of the Clean Water Act requires a permit from the U.S. Army Corps of Engineers (USACE) for the discharge of dredged or fill material into waters of the United States, including wetlands. Section 404(b)(1) of the Clean Water Act provides guidance to the USACE for issuing permits; compliance with the 404(b)(1) guidelines is required. The 404(b)(1) guidelines require the selection of the Least Environmentally Damaging Practicable Alternative (LEDPA).

to provide insight to local features, issues, and concerns. The PAC assisted in developing the statement of the study's purposes and why it is needed.

In recognition of these overall study purposes, the PAC developed the following set of goals that the study should seek to address:

- safer travel from Route I-395 to Route 9
- travel efficiency
- neighborhood protection
- economic development
- environmental protection
- long-range, comprehensive planning
- connectivity with other roads and towns
- access for emergency vehicles and general traffic
- historical/archeological preservation
- financial return for investment

1.3 Study Need

The need (i.e., the problem) for transportation improvements is based on poor roadway geometry in the study area combined with an increase in local and regional commercial and passenger traffic that has resulted in poor system linkage, safety concerns, and traffic congestion.

1.3.1 Poor System Linkage

Continuity in the transportation system is essential for efficient vehicle movements and travel patterns and safety. System continuity can be defined and measured by how often an existing highway transitions between wider, higher-speed segments to narrower, lower-speed segments. System linkage and improved mobility results from smooth interconnections and transitions between regional, high-speed, high-capacity highways. In connecting these types of highways, highway-design principles attempt to provide for gradual and consistent transitions in travel speed, roadway geometry, and capacity.

Vehicles traveling through the study area from I-395 to Route 9 generally proceed from I-395 to Routes 1A, 46, and 9 — a path that has abrupt transitions in travel speed, roadway geometry, and capacity, as follows:

- I-395 is a principal arterial highway between I-95 in Bangor and Route 1A in the study area. I-395 is a controlled-access highway with two eastbound and two westbound lanes separated by an approximate 50-foot grass median. It connects to Route 1A, in Brewer with a partial cloverleaf interchange. I-395 has a posted speed of 55 mph and has a paved shoulder approximately 10 feet wide.
- Route 1A is a principal arterial highway connecting the greater Bangor and Brewer area

with Ellsworth and the coast at Bar Harbor. West of the I-395 interchange, Route 1A has two eastbound lanes and two westbound lanes. East of the I-395 interchange, Route 1A has one eastbound lane, one westbound lane, and a center turn lane from Brewer to approximately 1.3 miles east of the I-395 interchange. The remainder of Route 1A in the study area and to the coast has one eastbound and one westbound lane with no center turn lane. Access to Route 1A from its adjacent properties is not controlled and is subject to the state's rules on access management. Route 1A in the study area is posted at 25 to 45 mph, depending on location, and has a paved shoulder approximately 6 feet wide. The land uses adjacent to Route 1A in the study area are primarily commercial and residential with some undeveloped and underdeveloped areas. Over time, the areas adjacent to Route 1A are becoming increasingly more commercial.

- Route 46 is a two-lane collector road connecting Route 1A to Route 9. Access to Route 46 from adjacent properties is not controlled and is subject to Maine's rules on access management. Portions of Route 46 are steep and exceed the State of Maine's design criteria. Route 46 is posted at 35 or 45 mph and has a gravel shoulder approximately four feet wide. The land cover

adjacent to Route 46 is primarily mature forested areas with scattered residences and open areas. Approaching Route 9, the land uses adjacent to Route 46 are primarily residential. Because of the mature forest canopy, considerable portions of Route 46 are shaded, and snow and ice cover does not melt rapidly.

- Route 9 is a two-lane principal arterial highway connecting the greater Bangor and Brewer area with Washington County and the Canadian Maritime Provinces to the east. Access to Route 9 from its adjacent properties is not controlled and is subject to Maine's rules on access management. Route 9 is posted at 35 or 55 mph with some school zones, depending on location in the study area, and has a paved shoulder approximately eight feet wide. The land uses adjacent to Route 9 in the study area are primarily commercial and residential with some undeveloped and underdeveloped areas. Over time, the areas adjacent to Route 9 are becoming increasingly more developed. To the east of the study area, the land uses and land cover adjacent to Route 9 quickly become less developed and more forested, and the speed limit increases to 55 mph. Most of the land adjacent to Route 9 east of the study area to the Canadian border is undeveloped.

Logical termini are features such as cross-route locations that are considered rational end-points for a transportation improvement and that serve to make it usable.

A principal arterial highway is a highway found in both urban and rural areas that connects urban areas, international border crossings, major ports, airports, public transportation facilities, and other intermodal transportation facilities.

A controlled-access highway is a highway that provides limited points of access. Interstate highways are controlled-access highways in which access points occur only at interchanges.

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Access Management

The 119th Maine Legislature approved LD 2550, An Act to Ensure Cost-Effective and Safe Highways in Maine. The purpose of the Act is to ensure the safety of the traveling public and protect highways against negative impacts of unmanaged access.

The Act specifically directs the MaineDOT and authorized municipalities to promulgate rules to ensure safety and proper access on all state and state-aid highways with a focus on maintaining posted speeds on arterial highways outside urban compact areas.

More information can be found at <http://www.state.me.us/mdot/planning-process-programs/amprogram.php>.

The results of these deficiencies in system linkage are safety concerns, delays in passenger and freight movement, and conflicts between local and regional traffic.

1.3.2 Safety Concerns

Locations in the study area exhibit higher crash rates than other locations in Maine with similar characteristics.

Data were collected and analyzed to identify high crash locations (HCLs) using a critical rate factor (CRF). The CRF of an intersection or roadway section is a statistical measure of that location's crash history as compared to locations with similar geography, traffic volume, and geometric characteristics. When a CRF exceeds 1.00, the intersection or portion of a roadway has a higher-than-expected crash rate. Those locations with a CRF higher than 1.00 and more than eight crashes in a three year-period are considered HCLs.

Data were collected and analyzed to identify HCLs in the study area (exhibit 1.2). MaineDOT crash data for January 2004 through December 2008 indicate 10 HCLs that meet the criteria in the study area (MaineDOT, 2007c; MaineDOT, 2010).

The majority of crashes occurred on clear days with dry road conditions (MaineDOT, 2000b).

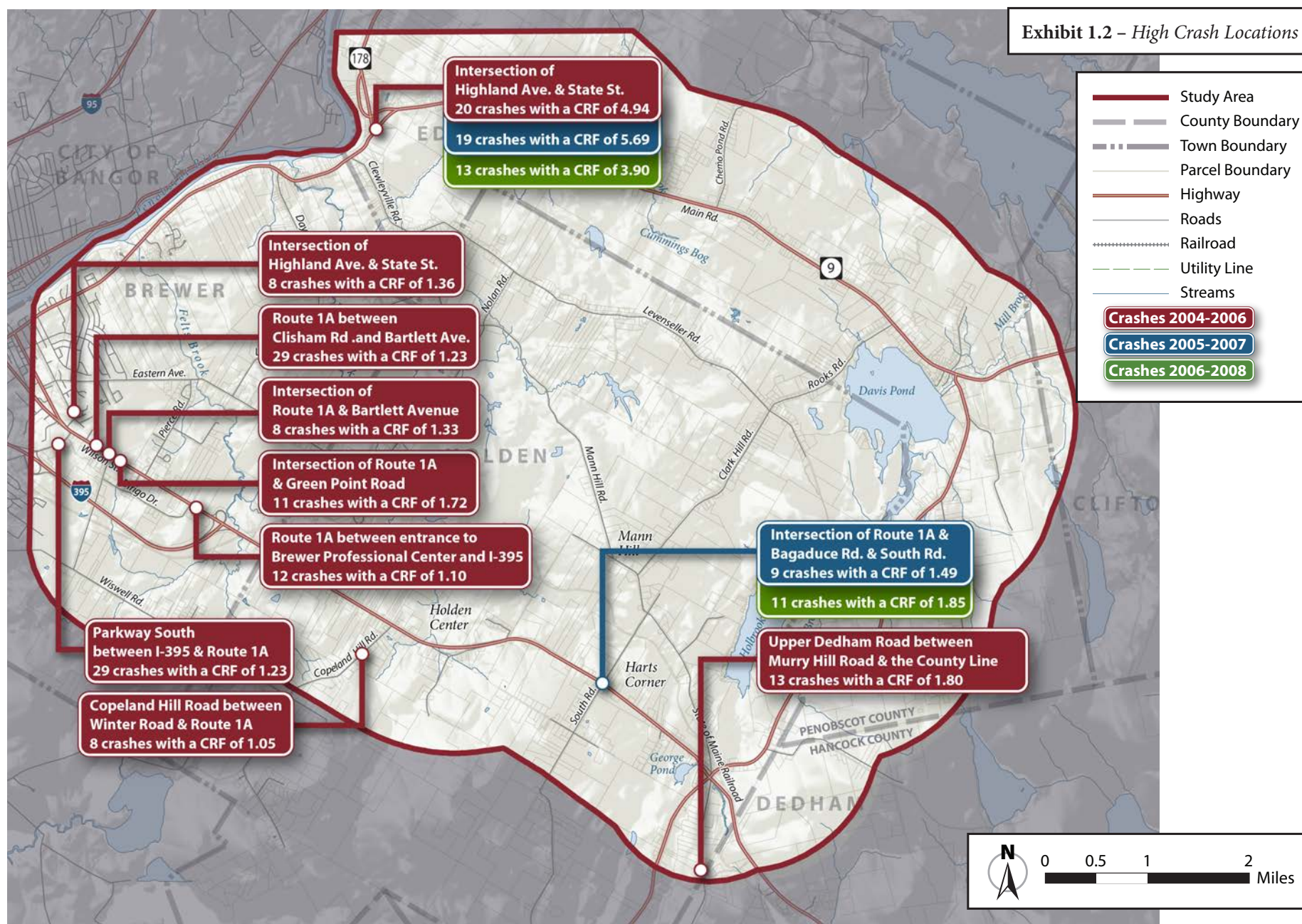
1.3.3 Traffic Congestion

Since the extension of I-395 from Bangor to Route 1A in 1986, traffic volumes in the study area have increased steadily. This growth has been most pronounced along Route 46 between Routes 1A and 9, which has become more widely used by both passenger vehicles and trucks as a connection among I-95, I-395, and Route 9.

Much of the truck traffic in the study area is through-traffic. Most of the truck trips are between the Canadian Maritime Provinces and Washington County at the eastern end, and Penobscot County and the New England states at the western terminus of the trips (MaineDOT, 2000a). Approximately 80 percent of truck traffic on Route 9 uses Route 46, and approximately five of six heavy trucks that use Routes 46 and 1A also use I-395 (MaineDOT, 2001). Route 46 south of Route 9 exhibited the greatest annual growth rate (i.e., annual growth factor of 1.121) in heavy-truck traffic between 1983 and 1996 of all roadways in the greater Bangor area (BACTS, 1998).

Estimates of the current and future annual average daily traffic (AADT) for all vehicles and heavy trucks were determined based on MaineDOT traffic count data (exhibit 1.3).

In 2008, with the economic downturn and increase in the price of gas, traffic in the study area has not grown as fast as previously thought. The MaineDOT and FHWA anticipate the growth in traffic and traffic



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Exhibit 1.3 – Existing and Future Traffic

<i>Location</i>	<i>1998 AADT</i>	<i>2006 AADT</i>	<i>2010 AADT</i>	<i>2035 AADT</i>	<i>2010 Truck AADT</i>	<i>2035 Truck AADT</i>	<i>% Growth 1998–2035</i>	<i>Growth Per Year 1998–2035</i>
Route 1A east of I-395	18,140	20,370	22,236	33,070	1,569	2,449	82%	2.57%
Route 1A west of Route 46	16,550	15,220	16,976	30,600	1,569	2,449	85%	2.65%
Route 1A east of Route 46	11,220	11,260	12,116	18,870	1,569	2,449	68%	2.13%
Route 46 south of Route 1A	1,920	1,870	2,021	3,130	265	281	63%	1.97%
Route 46 north of Route 1A	2,270	2,270	3,058	8,570	604	1,167	278%	8.67%
Route 9 east of Route 178	6,440	6,870	7,156	8,730	569	662	36%	1.11%
Route 9 west of Route 46	4,780	5,050	5,129	5,410	604	1,167	13%	0.41%
Route 9 east of Route 46	5,100	5,400	5,830	10,940	879	1,535	115%	3.58%

volumes originally forecasted for the study area for the year 2030 won't materialize until the year 2035. By 2035, traffic volumes on Route 46 between Routes 1A and 9 are forecasted to increase by approximately 6,300 vehicles (i.e., 278 percent) (MaineDOT, 2007a).

The projected increases in traffic would lead to more traffic congestion. To help measure the traffic congestion problem and the quality of traffic flow, the MaineDOT modeled existing (i.e., 1998 and 2006) and future (i.e., 2035) design hour volumes (DHVs) of traffic for three roadways in the study area: Routes 1A, 9, and 46. The DHV is the 30th highest hour of travel during a year at a given location; therefore, it accurately reflects the heaviest summer travel congestion.

The MaineDOT used the DHVs to determine the volume-to-capacity (v/c) ratio, operating speeds, and overall level of service (LOS) for the following five roadway segments within the study area: (1) Route 1A east of the I-395 interchange and west of Route 46; (2) Route 1A east of Route 46; (3) Route 46 between Routes 1A and 9; (4) Route 9 east of Route 178 and west of Route 46; and (5) Route 9 east of Route 46.







The v/c ratio is a measure of traffic demand on a roadway (expressed as volume, “v”) compared to its traffic-carrying capacity (expressed as capacity, “c”). For example, a v/c ratio of 0.7 indicates that a roadway is operating at 70 percent of its capacity.

The average travel speed is an important measure of the quality of traffic flow because it reports traffic flow in terms that most people can understand and to which they can relate their own experiences.

LOS is a qualitative measure of the performance of a roadway describing operational conditions. Generally, the LOS is defined in terms of speed, travel time, freedom to maneuver, traffic interruptions, comfort, and convenience (exhibit 1.4). Six LOS “levels” are defined for each type of roadway with different analyses and definitions for each type. Letters designate each “level” with LOS A representing the best operating conditions and LOS F representing the worst. Each LOS represents a range of operating conditions and relies heavily on the perceptions of drivers. In developed areas, LOS D is typically the “worst” traffic condition considered acceptable during normal peak hours.

In evaluating the performance of roadways, the v/c ratios and average operating speeds should be considered together with LOS, which is more of a qualitative assessment. The three performance measures do not necessarily indicate the same need to improve a roadway. For example, a roadway improvement may address an unfavorable LOS, but the roadway may already have ample capacity. Similarly, improvement in a road could reduce the v/c ratio but only have a minimal impact on average travel speed.

Exhibit 1.4 – LOS Thresholds on Two-Lane Rural Highways

Level of Service	Flow Conditions	Operating Speed (mph)	Technical Descriptors
A		55+	Highest quality of service. Free traffic flow; low volumes and densities. Little or no restriction on maneuverability or speed. No Delays
B		50	Stable traffic flow; speed becoming slightly restricted. Low restriction on maneuverability. No Delays
C		45	Stable traffic flow but less freedom to select speed, change lanes, or pass. Density increasing. Minimal Delays
D		40	Approaching unstable flow. Speeds tolerable but subject to sudden and considerable variation. Less maneuverability and driver comfort. Minimal Delays
E		35	Unstable traffic flow with rapidly fluctuating speeds and flow rates. Short headways, low maneuverability, and low driver comfort. Significant Delays
F		25-	Forced traffic flow. Speed and flow may drop to zero with high densities. Considerable Delays

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Exhibit 1.5 – DHV, v/c Ratio, Average Travel Speed, and LOS for Roadways Segments

Year	DHV	v/c Ratio	Average Travel Speed (mph)	LOS Rural Two-Lane Road
Route 1A east of I-395				
1998	1,840	0.63	34.6	E
2006	2,001	0.69	33.2	E
2035	3,269	1.12	varies	F
Route 1A east of Route 46				
1998	1,282	0.43	44.1	D
2006	1,268	0.43	44.2	D
2035	2,123	0.72	37.5	E
Route 46 between Routes 1A and 9				
1998	244	0.14	45.1	C
2006	197	0.12	45.6	C
2035	1,006	0.40	40.8	D
Route 9 east of Route 178				
1998	641	0.27	41.2	D
2006	629	0.26	41.3	D
2035	873	0.36	39.5	E
Route 9 east of Route 46				
1998	505	0.20	43.9	D
2006	573	0.23	43.5	D
2035	1,267	0.46	39.3	E

The MaineDOT estimated the v/c ratios, operating speeds, and overall LOS of these roadway segments using peak season 1998 and 2006 travel conditions and forecasted peak season 2035 travel conditions (exhibit 1.5). Route 1A east of the I-395 interchange and west of Route 46 is forecasted to decrease in service from

LOS E in 1998 to LOS F by 2035 (MaineDOT, 2007a). LOS F represents heavily congested flow with traffic demand exceeding capacity (Transportation Research Board, 1998). Route 1A east of Route 46 is forecasted to decrease from LOS D in 1998 to LOS E by 2035 (MaineDOT, 2007a). LOS E is defined as traffic flow on two-lane highways having a time delay of greater than 75 percent. Passing under LOS E conditions is virtually impossible. LOS E is seldom attained over extended sections of level terrain on more than a transient condition; most often, small disturbances in traffic flow as LOS E is approached cause a rapid transition to LOS F (Transportation Research Board, 1998).

The intersection of Routes 1A and 46 is a signalized intersection. This intersection handles traffic traveling to and from the areas of Downeast Maine and traffic to and from the Ellsworth area and the coast. In 1998, the overall performance of this intersection was estimated using peak-volume conditions at LOS B (exhibit 1.6). By 2035, with increases in traffic volume and corresponding increases in delays, this intersection is forecasted to decline to an overall performance of LOS F. LOS F at a signalized intersection describes a control delay exceeding 80 seconds per vehicle. This LOS occurs when arrival flow rates exceed the capacity of the intersection (Transportation Research Board, 1998).

Exhibit 1.6 – LOS Criteria for Signalized Intersections

Level of Service	Control Delay Per Vehicle (Seconds)
A	< 10
B	> 10 and < 20
C	> 20 and < 35
D	> 35 and < 55
E	> 55 and < 80
F	> 80

The intersection of Routes 46 and 9 is an unsignalized intersection. This intersection handles traffic traveling to and from Bangor (and the Interstate system) and Downeast Maine. Unsignalized intersections are not defined by an overall LOS for the intersection; individual approaches to the intersection are evaluated in terms of delay (measured in seconds) and expressed by a LOS. Threshold LOS values for individual approaches to unsignalized intersections are lower for unsignalized intersections (exhibit 1.7) than for signalized intersections because of the difference between idling at a stop sign, actively looking for a gap in traffic, and idling at a traffic signal, passively waiting for the green phase. The more onerous activity of searching for a gap and the uncertainty of when that gap would arrive makes delay at a stop sign more difficult than at a traffic signal.

In 1998, the delay on the northbound approach of Route 46 to the intersection of Routes 46 and 9 was estimated using peak volume conditions to be 6.5

Exhibit 1.7 – LOS Criteria for Individual Approaches to Unsignalized Intersections

Level of Service	Control Delay Per Vehicle (Seconds)
A	< 10
B	> 10 and < 15
C	> 15 and < 25
D	> 25 and < 35
E	> 35 and < 50
F	> 50

seconds (LOS A) (exhibit 1.8). By 2035, with increases in traffic volume, this delay is forecasted to increase to 119.4 seconds (LOS F). LOS F at an unsignalized intersection occurs when there are insufficient gaps of suitable size to allow side-street traffic to safely cross through a major-street traffic system (Transportation Research Board, 1998).

The November 2011 change in weight restrictions on I-95 had an impact on truck traffic patterns in Maine, particularly on highways north and east of Portland. Limited vehicle classification data collected during the 2010 pilot study and an extensive 2012 follow-up

Exhibit 1.8 – Delay on Route 46 at the Intersection of Routes 46 and 9

Year	Delay (Seconds)
1998	6.5
2006	5.6
2010	7.5
2035	119.4

short-term vehicle classification counting program in central, eastern, and northern Maine provided new information on Class 10 (tractor-trailers with six axles) travel patterns. These class counts, along with data from permanent classification sites, were compared to 2011 class data to identify corridors where changes in Class 10 volumes and travel patterns have appeared.

The lifting of the 80,000-pound weight restrictions on the toll-free portions of the Interstate showed definite shifts of 6-axle truck traffic toward toll-free Interstate highways and away from parallel state highways and the Maine Turnpike, where the restriction has long been 100,000 pounds.

Exhibit 1.9 –
The NEPA Process



1.4 Federal and State Decisions and Actions

The MaineDOT and the FHWA, with input from the public and the federal and state regulatory and resource agencies, will decide which action to take in accordance with the National Environmental Policy Act (NEPA). The NEPA process is intended to help public officials make decisions based on an understanding of the environmental consequences and to take actions that protect, restore, and enhance the environment (40 CFR Part 1500.1) (exhibit 1.9).

This document identifies reasonable alternatives and assesses their potential transportation, social,

economic, and environmental impacts. NEPA requires federal agencies to consider the impacts of their actions on the natural, social, economic, and cultural environment and to disclose those considerations in a public decision-making document referred to as an Environmental Impact Statement (EIS). The EIS is first circulated publicly as a DEIS. Following publication of the DEIS, a public hearing is held to solicit additional public input for the federal decision-making process. Public input is accepted during an open public-comment period following publication of the DEIS.

The purpose of this FEIS is to provide the FHWA, the MaineDOT, other federal and state agencies, and the public with a full accounting of the anticipated environmental impacts of the alternatives developed for meeting the study's purpose and needs and identifies the preferred alternative—Alternative 2B-2. The EIS serves as the primary document to facilitate review of the proposed action by federal, state, and local agencies and the public. The EIS will provide full discussion of potential environmental impacts and will inform decision makers and the public of reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment (40 CFR Part 1502.1). An EIS must briefly discuss the purpose and need for the proposed action, the range of alternatives considered, the resultant environmental impacts from the proposed action, and the agencies and

people consulted during the planning of the proposed action and identifies the preferred alternative.

Publication of the FEIS would be followed by the FHWA issuing a Record of Decision (ROD). The ROD would accomplish the following:

- State the decision.
- Identify all alternatives considered by the lead agencies in reaching their decision, clearly stating the reasons for selecting the environmentally preferred alternative. An agency may discuss preferences among alternatives based on relevant factors, including economic and technical considerations and agency statutory missions. An agency will identify and discuss all such factors, including any essential considerations of national policy that were balanced by the agency in making its decision, and state how those considerations entered into its decision.
- Identify the LEDPA.
- State whether all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted, and if not, why they were not. A monitoring and enforcement program would be adopted and summarized where applicable for any mitigation (40 CFR Part 1505.2) and will include the comments on the FEIS with responses.

This FEIS provides the MaineDOT with the decision-making tool required by the Sensible Transportation Policy Act (STPA), which mandates that the MaineDOT “evaluate the full range of reasonable transportation alternatives for significant highway construction or reconstruction projects.” The MaineDOT actions that may proceed after completion of the NEPA process may include final design, property acquisition for use as transportation right-of-way, and construction.

This EIS integrates the requirements of Section 404 of the CWA and provides information in support of the preliminary permit application submitted to the USACE. The USACE provides oversight and regulates activities in the nation’s waters. A Section 404 individual permit would be required from the USACE for the discharge of dredged or fill material into the Waters of the United States, which include wetlands. Section 404(b)(1) of the CWA provides guidance to the USACE for the issuance of permits; compliance with Section 404(b)(1) is required. Section 404(b)(1) requires project sponsors to select the Least Environmentally Damaging Practicable Alternative (LEDPA).

A permit would not be issued if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. The LEDPA should be

determined prior to completing the FEIS/ROD because the ROD documents the Preferred Alternative.

The objective of this FEIS is to identify a solution that furthers the study purpose, satisfies the needs of the study, and minimizes adverse environmental and social impacts at an affordable cost and identifies the preferred alternative, explains the basis for its selection, describes coordination efforts, and includes agency and public comments, responses to the comments and required findings and/or determinations (40 CFR 1502.14(e)).

1.5 Applicable Regulations, Guidance, and Required Permits and Approvals

The following statutes and orders apply to the proposed action and were considered during the performance of this study and preparation of this EIS:

- American Indian Religious Freedom Act (AIRFA)
- Archeological and Historical Preservation Act (AHPA)
- Archeological Resources Protection Act (ARPA)
- Clean Air Act (CAA), 40 CFR 50
- Coastal Zone Management Act of 1972 (CZMA), 15 CFR 930
- Community Environmental Response Facilitation Act
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 40 CFR 373 and 41 CFR 101-47
- Endangered Species Act, as promulgated at 50 CFR 17
- Environmental Impact and Related Procedures, 23 CFR 771, signed March 24, 2009
- Environmental Quality Improvement Act
- Executive Order 11514 Protection and Enhancement of Environmental Quality
- Executive Order 11593 Protection and Enhancement of the Cultural Environment
- Executive Order 11988, Floodplain Management, 42 FR 26951, signed May 24, 1977
- Executive Order 11990, Protection of Wetlands, 42 FR 26961, signed May 24, 1977
- Executive Order 12088 Federal Compliance with Pollution Control Standards
- Executive Order 12372, Intergovernmental Review of Federal Programs
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 59 FR 7629, signed February 11, 1994
- Executive Order 13007, Indian Sacred Sites
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, 65 FR 50121, signed August 11, 2000

- Farmlands Protection Policy Act, 7 CFR 658 and 7 CFR 657
- Federal Facility Compliance Act
- Federal Records Act, 36 CFR 1222, 1228, 1230, 1232, 1234, 1236, and 1238
- Federal Register, Environmental Impact and Related Procedures; Final Rule, 23 CFR Parts 635, 640, 650, 712, 771, and 790; and 40 CFR Part 622, August 28, 1987
- Federal Register, Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, 40 CFR Parts 1500-1508, November 29, 1978
- Fish and Wildlife Coordination of 1956, as amended, 16 USC 661-667e
- Historic Sites Act, 36 CFR 65
- Magnuson–Stevens Fishery Conservation and Management Act, 50 CFR Part 600
- Maine Department of Environmental Protection, Natural Resources Protection Act, 38 Maine Revised Statutes Annotated (MRSA), Chapter 3 § 480 et seq.
- Maine Department of Environmental Protection/ Maine Department of Transportation, Stormwater Memorandum of Understanding
- Maine Endangered Species Act, 12 MRSA § 7751
- Maine Hazardous Waste, Septage, and Solid Waste Management Act, 38 MRSA § 1301, 1979
- Maine Revised Statutes, Sensible Transportation Policy Act of 1991, 23 MRSA § 73
- Migratory Bird Treaty Act of 1918, 16 USC, 703-712
- Native American Graves Protection and Repatriation Act (NAGPRA), 43 CFR 10
- Public Law 91-190, National Environmental Policy Act of 1969, 42 USC § 4321 et seq., signed January 1, 1970
- Public Law 95-217, Clean Water Act of 1977, 33 USC § 1251-1376
- Resource Conservation and Recovery Act (RCRA), 40 CFR 260-281
- Safe Drinking Water Act, 40 CFR 141
- Section 106 of the National Historic Preservation Act of 1966, as amended, 16 USC 470
- Sections 401 and 404 of the Clean Water Act (CWA)
- Section 6(f) of the Land and Water Conservation Act of 1965, 16 USC 460
- Toxic Substances Control Act (TSCA), 40 CFR 761
- Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, 42 USC 61
- 23 CFR 774 Policy on Lands, Wildlife and Waterfowl Refuges, and Historic Sites
- 23 USC. 111, Access to the Interstate System

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The MaineDOT would be required to obtain the following permits and approvals prior to the advertisement of construction:

- Section 404 (of the CWA) Individual Permit: The USACE provides oversight and regulates activities in the nation's waters. A Section 404 individual permit would be required from the USACE for the discharge of dredged or fill material into the waters of the United States, which include wetlands. Section 404(b)(1) of the CWA provides guidance to the USACE for the issuance of permits; compliance with Section 404(b)(1) is required. Section 404(b)(1) may only permit discharges of dredged or fill material into waters of the United States that represent the LEDPA, so long as the alternative does not have other significant adverse environmental consequences.
- Natural Resources Protection Act (NRPA) Permit: A NRPA Permit is required from the Maine Department of Environmental Protection (MDEP) for projects in, on, over, or adjacent to protected natural resources. Protected resources are coastal wetlands, great ponds, rivers, streams, significant wildlife habitat, and freshwater wetlands.
- Section 401 Water Quality Certification: Section 401 of the CWA regulates the discharge of dredged or fill materials into waters. A Section 401 Water Quality Certification is required from the MDEP to ensure that the project would comply with state water-quality standards. Typically, the Section 401 Water Quality Certification would be issued concurrently by the MDEP with the NRPA Permit.
- Coastal Zone Management Consistency Determination: The portion of the study area in the city of Brewer is within the state's statutory coastal zone and subject to the provisions of the Coastal Zone Management Act (CZMA) of 1972 and the Maine CZM Program. The Maine Department of Agriculture, Conservation and Forestry administers the Maine Coastal Program. For efficiency, consistency reviews and determinations are rendered following the review and approval of state permit applications. This project would require a NRPA Permit issued by the MDEP and would require a CZM Consistency Determination issued with the NRPA Permit.

Chapter 2

Alternatives Analysis

Chapter 2 presents the alternatives analysis. It introduces the range of reasonable alternatives developed to meet the study purpose and needs and the USACE's basic project purpose. It identifies those alternatives retained or dismissed from more detailed study and the reasons for their retention or dismissal.

2.1 Introduction

From 2001 to 2011, MaineDOT and the FHWA conceptually designed and analyzed the No-Build Alternative and more than 70 build alternatives that could potentially satisfy the study purpose and needs and the USACE basic project purpose (exhibit 2.1). In conceptually designing and analyzing alternatives, MaineDOT and the FHWA consulted with regulatory and resource agencies at the state and federal level, local officials, special-interest groups, native American tribal governments and the public. At the end of the process of identifying, developing, analyzing, and screening alternatives, four alternatives, including the No-Build Alternative, were retained for further consideration and detailed study.

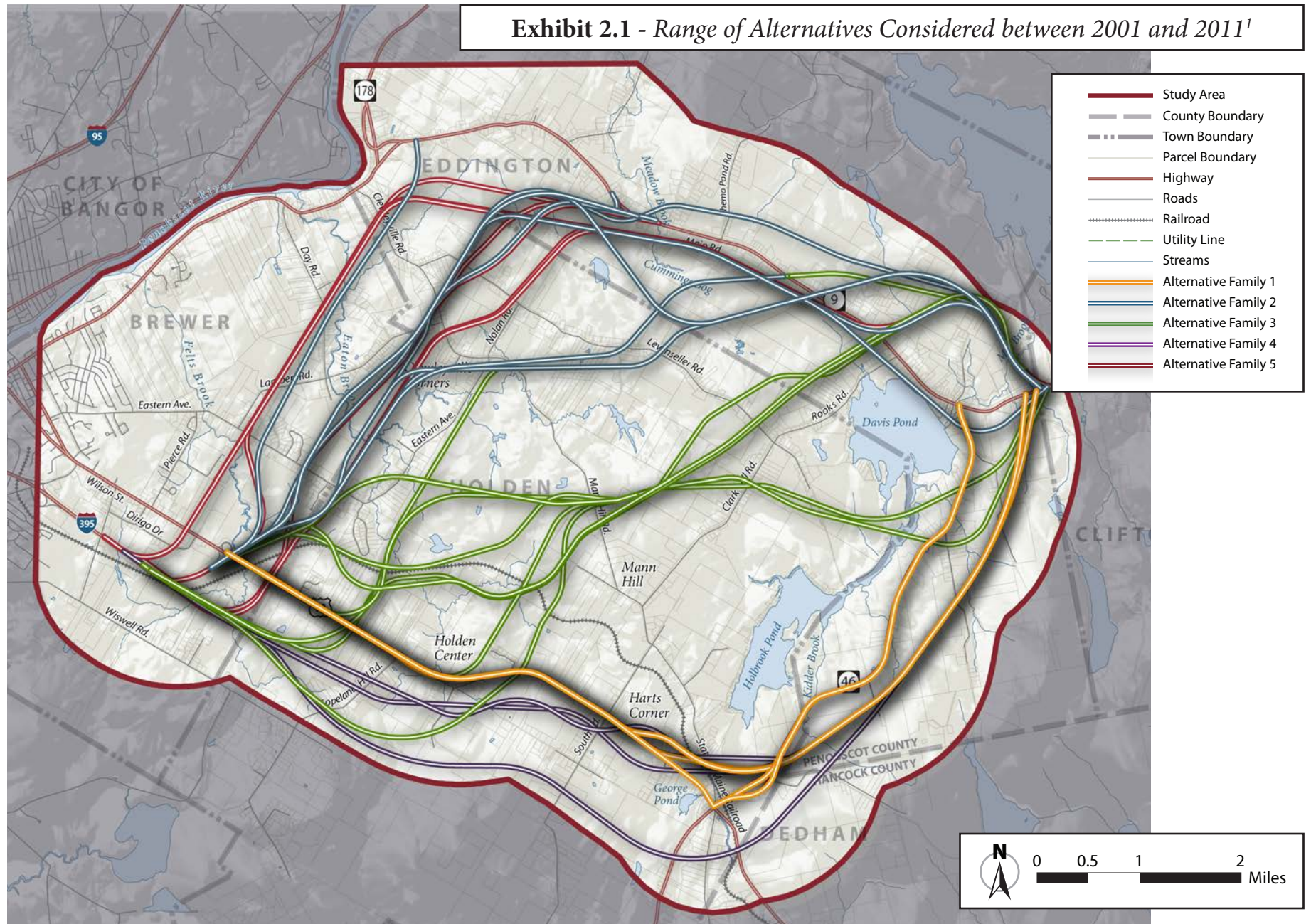
Alternatives were identified, developed, and analyzed in accordance with requirements of NEPA and Section 404 of the CWA. NEPA requires MaineDOT and FHWA to consider the impacts of an action on the environment and to disclose those impacts in a public decision-making process. Alternatives generally should be discussed at a comparable level of detail. Although the No-Build Alternative (generally consisting of maintenance and short-term minor improvements) might not seem reasonable for satisfying the study purpose and needs, it must always be included in the analysis with its consequences fully developed. The No-Build Alternative serves as a benchmark against which the impacts of other alternatives can be compared.

Section 404 of the CWA regulates the discharge of dredged or fill material into waters of the United States, including wetlands. Section 404 requires a permit from the USACE before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from regulation (e.g., certain farming and forestry activities).

Chapter Contents

- 2.1 Introduction
- 2.2 Alternatives Identification, Development, and Analysis Process
- 2.3 Range of Reasonable Alternatives Retained for Consideration
- 2.4 Other Activities Necessary to Construct Alternative 2B-2/the Preferred Alternative and Estimated Construction Cost
- 2.5 Next Steps
- 2.6 Most Essential Differences among the Alternatives to be Considered in Decision Making

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¹ **Note:** Alternative alignments shown here have been grouped into families. For a detailed discussion of each family, please refer to Appendix C of the DEIS.

Under Section 404, no discharge of dredged or fill material into waters of the United States may be permitted if (1) a practicable alternative exists that is less damaging to the aquatic environment, or (2) the nation's waters would be significantly degraded. To be granted a permit, the project must show that it has, to the extent practicable:

- taken steps to avoid waters and wetlands impacts
- minimized potential impacts on waters and wetlands
- provided compensation for remaining unavoidable impacts

2.2 Alternatives Identification, Development, and Analysis Process

In May 2001, MaineDOT and the FHWA, with public and PAC assistance, identified potential corridors for alternatives using low-level, high-resolution aerial photography and mapping of the land use, social features, and natural resources of the study area.

MaineDOT and the FHWA compiled and refined the suggested corridors into 45 alternatives. These initial 45 alternatives fit into the following four broad “families”:

- Family 1: The Upgrade Alternatives
- Family 2: The Northern Alternatives
- Family 3: The Central Alternatives
- Family 4: The Southern Alternatives

To reduce the number of alternatives identified and conceptually designed to a reasonable range, MaineDOT and the FHWA sought to identify one alternative from each family to be studied in detail. The decision of whether to dismiss or retain alternatives for further analysis was based on their ability to satisfy the study purpose and needs, results of the preliminary impacts analysis, and consideration of overall engineering feasibility. If more than one alternative in each family fully satisfied the study purpose and needs and was practicable, the alternative was selected based on potential impacts to the features and resources. Alternatives that were more environmentally damaging than others were dismissed from further consideration and alternatives that were the least environmentally damaging were retained for further consideration.

In June 2004, alternatives were identified and developed parallel to the utility easements with the Bangor Hydro-Electric Company transmission lines. This family of alternatives, which start with the number 5, began at or near the I-395/Route 1A interchange and largely paralleled the electric transmission lines in the City of Brewer and the towns of Holden and Eddington.

The process of identifying, developing, and screening alternatives or modifying alternatives continued. In January 2008, the following seven alternatives were preliminarily identified for further consideration and development and detailed study:

Wetlands subject to Section 404 can be defined as “areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas” (CWA, Section 404).

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Practicable may be defined as “available and capable of being done after considering cost, existing technology, and logistics in light of the overall project purpose.”

The regulations implementing the NEPA (40 CFR 1502.14) require that the lead agencies:

- a. Rigorously explore and objectively evaluate all reasonable alternatives and, for alternatives that were eliminated from detailed study, briefly discuss the reasons for their elimination.
- b. Devote substantial treatment to each alternative considered in detail, including the proposed action, so that reviewers may evaluate their comparative merits.
- c. Include reasonable alternatives not within the jurisdiction of the lead agency
- d. Include the alternative of no action.
- e. Identify the agency's preferred alternative or alternatives, if one or more exists, in the DEIS and identify such alternative in the FEIS, unless another law prohibits the expression of such a preference.
- f. Include appropriate mitigation measures not already included in the proposed action or alternatives.

- No-Build Alternative
- Alternative 1-1
- Alternative 2B-2
- Alternative 3A-3EIK-1
- Alternative 3EIK-2
- Alternative 5A2E3K
- Alternative 5B2E3K

In a continued effort to avoid and minimize adverse impacts in December 2008, six connectors between the three western most build alternatives were identified, conceptually designed, and analyzed at the beginning of the phase of considering alternatives in detail. Of the six alternatives that resulted from connecting Alternative 5A2E3K to Alternative 2B-2, two were retained for further consideration because they resulted in comparable or less impact to wetlands and fewer residential displacements than Alternatives 2B-2 and 5A2E3K. These alternatives were named Alternative 5A2B-2 and Alternative 5A2E3K-2.

In May 2009, a meeting took place with the federal and state regulatory and resource agencies to review the range of alternatives being considered. It was agreed that Alternatives 1-1 and 3A-3EIK-1 should be dismissed from further consideration because they did not meet all of the study's purpose and needs or it was more environmentally damaging than other alternatives.

In December 2009, the system linkage need and Route 9 were reexamined in greater detail. Specifically, Route 9 was reexamined to understand more fully if it could reasonably accommodate the future traffic volumes that were foreseeable within the next 20 years. After careful consideration of those factors, MaineDOT determined that Route 9, with the exception of the sections approaching the intersection of Routes 9 and 46 where the posted speed limit is lower than other segments of Route 9, could reasonably accommodate future traffic volumes for the next 20 years (due to the 2008 economic downturn and increase in the price of gas, traffic in the study area has not grown as fast as previously forecast) without additional improvements beyond the existing right-of-way.

In September and December 2010, meetings with the federal cooperating agencies took place, the purpose of which was to solidify the range of alternatives to be considered in detail. MaineDOT, the FHWA, and the federal cooperating agencies further considered the remaining build alternatives and concluded, although available and practicable, Alternatives 3EIK-2, 5A2E3K, 5A2E3K-2, and 5B2E3K-1 were more environmentally damaging than other build alternatives and were dismissed from further consideration (see DEIS Chapter 2 for a complete alternatives analysis). Alternative 5B2B-2 was created by connecting Alternative 5B2E3K to Alternative 2B-2.

The purposes and needs of this study and its solutions lie specifically in the study area. The privately funded East-West Highway concept has its own purposes, needs, and solutions in a different area. There has been much recent discussion about not needing a connection to the Interstate system in the I-395/Route 9 study area because a proposed new East-West highway would meet the system-linkage need between I-395 and Route 9. MaineDOT and FHWA would continue to consider the I-395/Route 9 Transportation Study because the East-West highway would not satisfy the purpose and needs of the study. Specifically:

- The system linkage need would not be satisfied.
 - o The I-395/Route 9 connector provides a distinct and more southerly connection. The traffic between the Canadian Maritime Provinces and the New England states is different from the traffic from the Maritime Provinces that want to travel to and from the larger markets of Quebec, Ontario, and the Midwestern United States to the West.
 - o The I-395/Route 9 connector is more sub-regional and local in nature. Only 1% of the traffic studied in the 1998 Origin-Destination Study traveled from the Maritime Provinces to other western Canadian destinations.
 - o The portions of Routes 1A and 46 in the study area would not provide an operationally efficient transportation facility for regional connectivity and mobility through the study area.
- The traffic congestion need would not be satisfied. Traffic would continue to operate at unacceptable quality of traffic flow and speed on Route 1A.

The current AADT along Route 9 in Eddington between the terminus of the Alternative 2B-2 and the Route 46 intersection is approximately 5,000 vehicles per day. The posted speed in this section of Route 9 is predominantly 45 mph, with 35 mph near the Route 46 intersection. Traffic on Route 9 can comfortably travel at the current posted speeds. This segment of Route 9 was constructed to a width that meets current National Highway System standards for 2-lane highways (12-foot travel lanes and 8-foot shoulders).

With Alternative 2B-2, the 2035 AADT along this segment of Route 9 is forecast to be approximately 12,000 vehicles per day. At that level of traffic flow, Route 9 can easily be maintained at the current posted speeds. There are many locations in Maine where AADTs of 15,000 to 17,000 are accommodated on 2-lane highways with 35-to-50 mph speeds. Many of these locations have more intense commercial development than Route 9 in Eddington. This indicates that traffic volume growth on Route 9 can be accommodated well beyond the year 2035.

As part of its planning process, MaineDOT regularly monitors traffic volume and traffic safety trends on all state highways, including Route 9. Traffic volumes are updated every three years, and crash data is reviewed annually to identify emerging conditions that would compromise safety and mobility. MaineDOT regulates development access to Route 9 through application of access management rules. These rules require a new development to provide safe access and maintain adequate mobility on the highway.

One way of maintaining safety and mobility along Route 9 as future development occurs is by establishing turn lanes where needed to minimize conflicts between turning traffic and through traffic. This treatment improves the safety of turns while maintaining or improving the flow of through traffic. There are examples in Maine where AADTs of 17,000 to 19,000 are accommodated on 3-lane highways (which have a 2-way left turn lane between the through lanes) with 40-to-50 mph speeds. Route 9 is adaptable ***within the existing Right-of-Way*** to this type of treatment, if conditions warrant.

With the capacity to accommodate much more than the forecasted traffic, the regular monitoring of safety and mobility conditions by MaineDOT, and the ability to accommodate additional development in a safe and efficient manner, the transportation benefits of Alternative 2B-2 would be sustainable well beyond 2035.

2.3 Range of Reasonable Alternatives Retained for Consideration

Four alternatives, including the No-Build Alternative, were retained for further consideration and analyzed in detail (exhibit 2.2).

- No-Build Alternative
- Alternative 2B-2
- Alternative 5A2B-2
- Alternative 5B2B-2

The cooperating agencies concurred with this range of alternatives to be retained for detailed analysis. MaineDOT and the FHWA would continue to work with the state and federal regulatory and resource agencies to ensure that environmental impacts are avoided and minimized to the extent practicable should a build alternative be selected and advanced to design and construction.

The build alternatives would be controlled-access highways and were conceptually designed using MaineDOT design criteria for freeways. Two lanes would be constructed and used for two-way travel within an appropriate 200-foot-wide right-of-way (exhibit 2.3). The 200-foot-wide right-of-way provides a sufficient width to allow a future widening, if needed; the need to widen beyond the 200-foot-wide right-of-way is beyond the reasonable foreseeable future time period.*

* While there were brief discussions regarding reducing the width from 200 feet to 100 or 125 feet, the right of way width was never changed and remains the 200-foot width as described in the DEIS.

Exhibit 2.2 - Alternatives Retained for Further Consideration

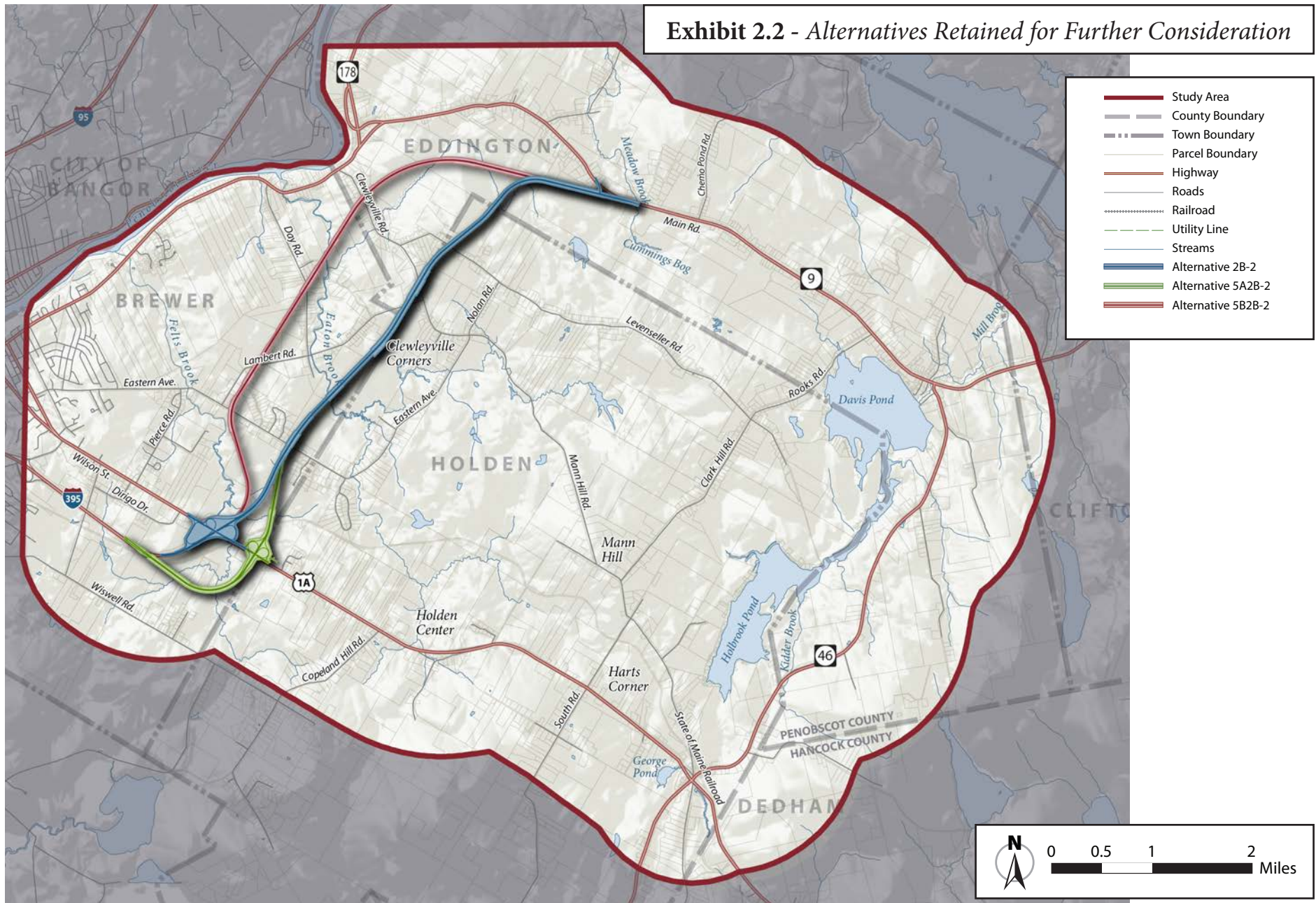
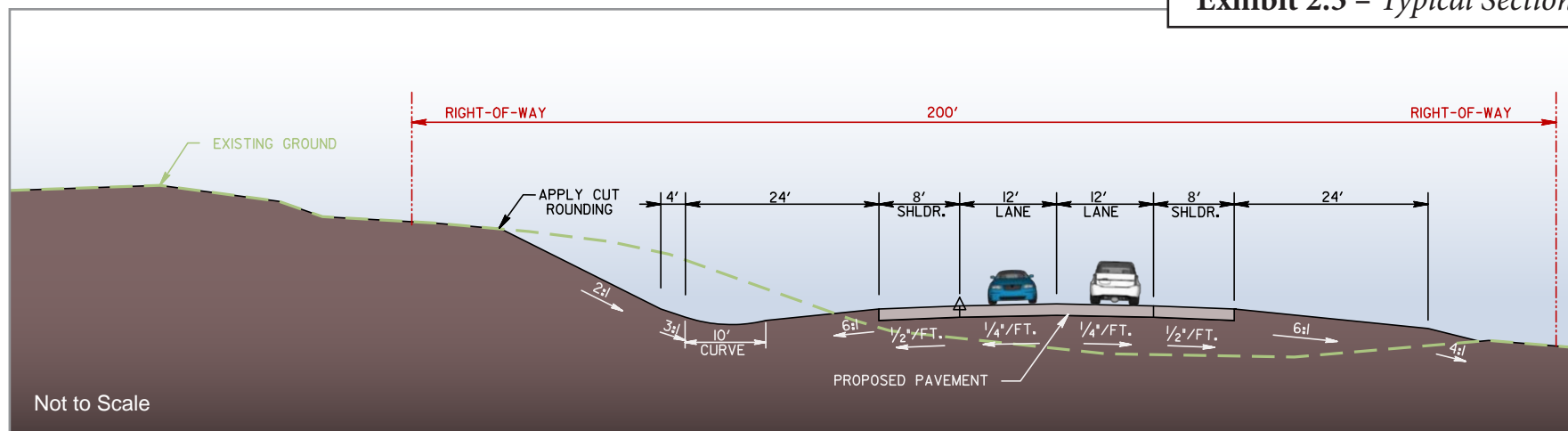


Exhibit 2.3 – Typical Section



During the study, it appeared that other alternatives would best satisfy the study purpose and needs. MaineDOT and FHWA studied those alternatives until it became clear that 1) those alternatives would result in greater adverse environmental impacts than Alternative 2B-2, and 2) Route 9 had adequate capacity and would continue to operate at an acceptable level of service and operating speed up to and beyond the year 2035 (the time period that has been determined to be reasonably foreseeable).

On three occasions during the study, Alternative 2B-2 (including earlier versions Alternative 2B and 2B-1) was tentatively dismissed from the range of reasonable alternatives considered for satisfying the study purpose and needs only to be added back to the range of alternatives considered. On each occasion, the DOT, in consultation with the PAC, tentatively

dismissed it and, in subsequent discussions with the Federal cooperating agencies, reconsidered it because it was practical and resulted in less adverse environmental impacts than other alternatives.

A preferred alternative that best satisfies the study purpose and needs with the least adverse environmental impact was not identified prior to the identification of Alternative 2B-2 as the preferred alternative in the DEIS. After careful consideration of the range of alternatives developed in response to the study's purpose and needs and in coordination with its cooperating and participating agencies, MaineDOT and the FHWA identified Alternative 2B-2 as the preferred alternative because it best satisfies the study purpose and needs, would fulfill their statutory mission and responsibilities, and has the least adverse environmental impact between the present time and the design year 2035. In identifying Alternative

2B-2 as their preferred alternative, MaineDOT and the FHWA have identified the environmentally preferable alternative because it best meets the purpose and needs for the study; causes the least damage to the biological and physical environment; and best protects, preserves, and enhances the historic, cultural, and natural resources of the study area.

Alternative 2B-2 was identified on July 31, 2012 as the LEDPA by the USACE (see Appendix B), and as such the alternative that could receive a permit from the USACE.

2.3.1 No-Build Alternative

The No-Build Alternative consists of maintenance and Transportation System Management (TSM) improvements. Regular maintenance consists of surface and shoulder work, ditch, bridge, culvert maintenance, snow and ice removal, emergency maintenance, mowing, brush control and other vegetation management, maintenance of stormwater runoff and management systems, erosion repair, striping, sign installation, and guardrail replacement. TSM is a set of relatively low-cost measures to increase capacity and/or provide safety improvements on an existing transportation system. These measures typically include traffic-signal timing or phasing adjustments, designation of turning lanes at specific intersections or driveways, access-management improvements, and enhanced signage

or markings. The No-Build Alternative serves as the baseline to which other alternatives can be compared. The No-Build Alternative proposes that there be no new construction or major reconstruction of the transportation system in the study area; regular maintenance to I-395 and Routes 1A, 46, and 9 would be continued at its present level; and the intersection of Routes 46 and 9 would be improved.

Improvements to the intersection of Routes 9 and 46 were conceptually designed to have additional through-travel and turn lanes. The improvements to this intersection could be accomplished within the existing rights-of-way of Routes 9 and 46 with no impact to the natural and social features adjacent to the intersection. MaineDOT is committed to improving the intersection of Route 9 and Route 46; given the future need and the limited scope of the improvements to the intersection, the improvements would be added to future work plans for MaineDOT. The proposed intersection would be studied and further developed during final design and discussed at a future public meeting.

The No-Build Alternative would not satisfy the study's purpose and needs or the USACE's basic purpose as it would not improve regional mobility and system linkage; would not improve safety; and would not reduce traffic congestion. The No-Build Alternative is retained for detailed analysis to allow equal comparison to the build alternatives and to help

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decision makers understand the ramifications of taking no action. The impacts of the No-Build Alternative were fully developed for design year 2035 to demonstrate the full impact of taking no action. Comparing the build alternatives with the current and future No-Build Alternative is essential for measuring the true benefits and adverse impacts of the build alternatives considered in detail.

2.3.2 Alternative 2B-2/The Preferred Alternative

Alternative 2B-2/the Preferred Alternative would continue north from the I-395 interchange with Route 1A, roughly paralleling the Brewer/Holden town line, and connect with Route 9 west of Chemo Pond Road (exhibit 2.4). Route 9 would not be widened to four lanes. The existing I-395/Route 1A interchange would be used (to the extent possible) and expanded to become a semi-directional interchange (exhibit 2.5). A semi-directional interchange reduces left turns and cross traffic; the only traffic movement that would require a left turn would be Route 1A south to the Alternative 2B-2/the Preferred Alternative north. The land required for the northern portion of the interchange is owned by the State of Maine.

Alternative 2B-2/the Preferred Alternative would bridge over Felts Brook in two locations at the I-395

The section of Route 9, from the intersection of 2B-2/the Preferred Alternative to the eastern edge of the study area, has adequate capacity and would continue to operate at an acceptable level of service and operating speed up to and beyond the year 2035 (the time period that has been determined to be reasonably foreseeable). Beyond the year 2035, should this section of Route 9 begin to operate at an unacceptable level of service, operating speed or safety, MaineDOT and FHWA would consider the need for additional improvements. The scope of the additional improvements could range from limited improvements within the existing right-of-way (e.g., small improvements at a specific location, additional turn lanes at intersections, addition of a center turn lane) to widening or a bypass of portions of Route 9.

interchange. It would pass underneath Eastern Avenue between Woodridge Road and Brian Drive. Alternative 2B-2/the Preferred Alternative would bridge over Eaton Brook, bridge over Lambert Road, pass underneath Mann Hill Road, and bridge over Levenseller Road connecting to Route 9 at a “T” intersection (exhibit 2.6). Route 9 eastbound would be controlled with a stop sign.

Alternative 2B-2/the Preferred Alternative would further the study’s purpose and satisfy the system linkage need in the near term (before 2035). Alternative

2B-2/the Preferred Alternative would be a controlled access highway and conceptually designed using MaineDOT design criteria for freeways. Two lanes would be constructed and used for two-way travel within an approximate 200-foot-wide right-of-way.

Route 9 would not be improved (beyond the improvements necessary to connect the preferred alternative), and it would not provide a high-speed, controlled-access connection to the east of East Ed-dington village. It would satisfy the study need related to traffic congestion and safety. It would satisfy the USACE's basic purpose statement.

MaineDOT submitted an Interstate Modification Report to FHWA in October 2012 which received conceptual approval in February 2013. Final approval of the Interstate Modification Report cannot occur until after the process for complying with the NEPA is completed (see adjacent text box).

Title 23, U.S. Code, Highways Section 111 (23 USC 111) provides that all agreements between the Secretary of the U.S. Department of Transportation and the State Departments of Transportation for the construction of projects on the Interstate System shall contain a clause providing that the State would not add any points of access to, or exit from, the project in addition to those approved by the Secretary in the plans for such a project without prior approval of the Secretary. The Secretary has delegated the authority to administer 23 USC 111 to the FHWA pursuant to 49 CFR 1.48(b)(10). A policy statement consolidating a series of policy memoranda including guidance for justifying and documenting the need for additional access to the existing sections of the Interstate System, was published in the Federal Register on October 22, 1990 (55 FR 42670) entitled "Access to the Interstate System" and was then modified on February 11, 1998 (63 FR 7045) and on August 27, 2009 (74 FR 20679).

An Interchange Modification Report (IMR) was prepared by MaineDOT and the FHWA to analyze, document and justify the new section of highway proposed by the I-395/Route 9 Transportation Study. The documentation is outlined in eight policy points, specified in FHWA's *Interstate Access Informational Guide*:

1. Need for Access Point Modification,
2. Reasonable Alternatives,
3. Operational and Safety Analyses,
4. Access Connections and Design,
5. Land Use and Transportation Plans,
6. Future Interchanges,
7. Coordination, and
8. Environmental Processes.

The IMR analyzed each of these policy points in detail and concluded that the poor system linkages, safety deficiencies and traffic congestion currently plaguing the study area combined with the reasonableness of the selected alternatives; and the ability of those alternatives to meet the future traffic needs, improve safety and system linkages in the study area, and leave relatively small impacts on the environment; meant that the I-395 to Route 9 project in Brewer, Maine meets the eight policy points of Interstate System access. The FHWA Division Administrator determined the IMR is acceptable from an operational and engineering standpoint on February 7, 2013. It is noted that final approval of the IMR cannot occur until after the completion of the NEPA process.

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Exhibit 2.4 – Alternative 2B-2/the Preferred Alternative

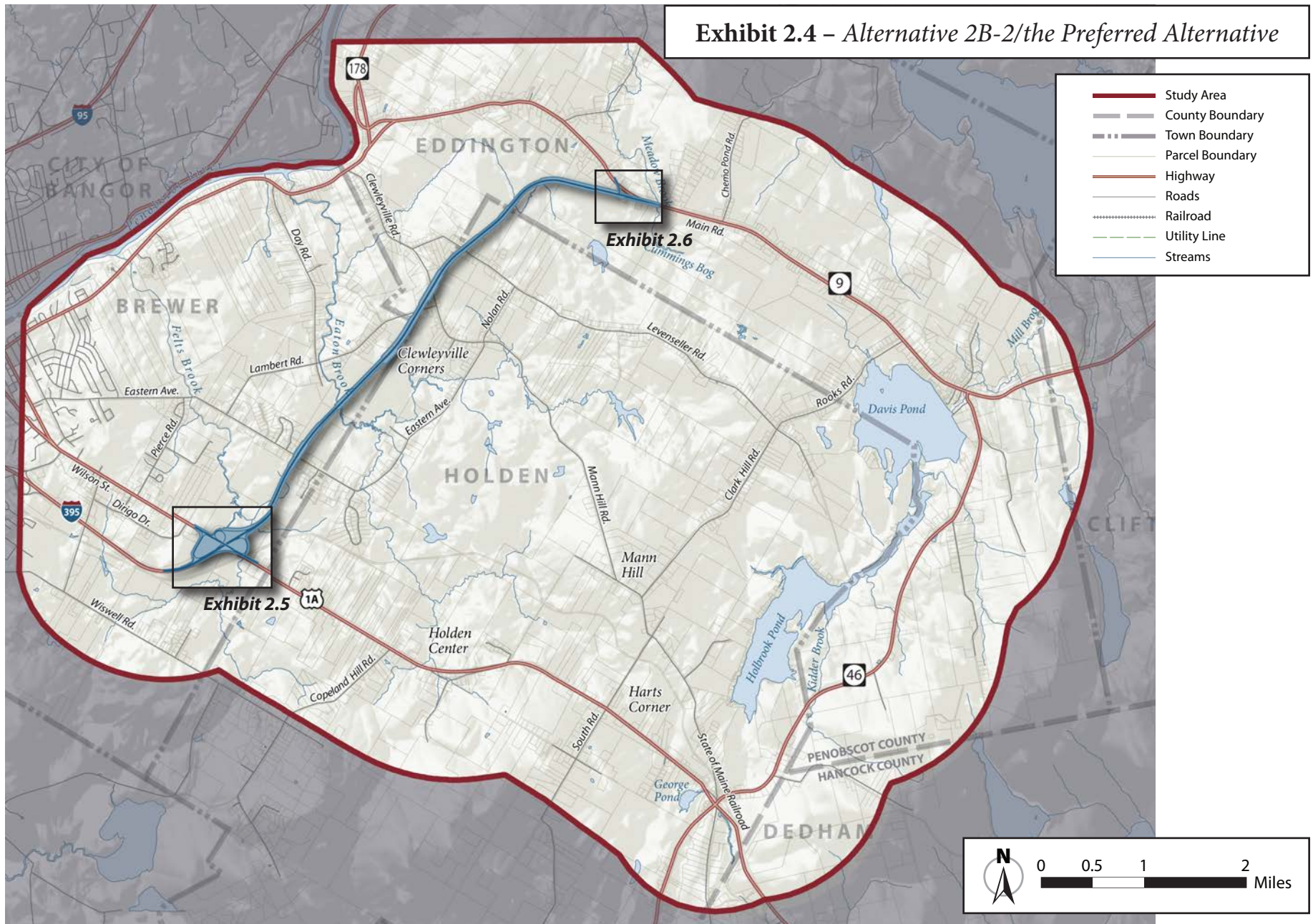


Exhibit 2.5 – Interchange of Alternatives 2B-2/the Preferred Alternative and 5B2B-2 and Route 1A

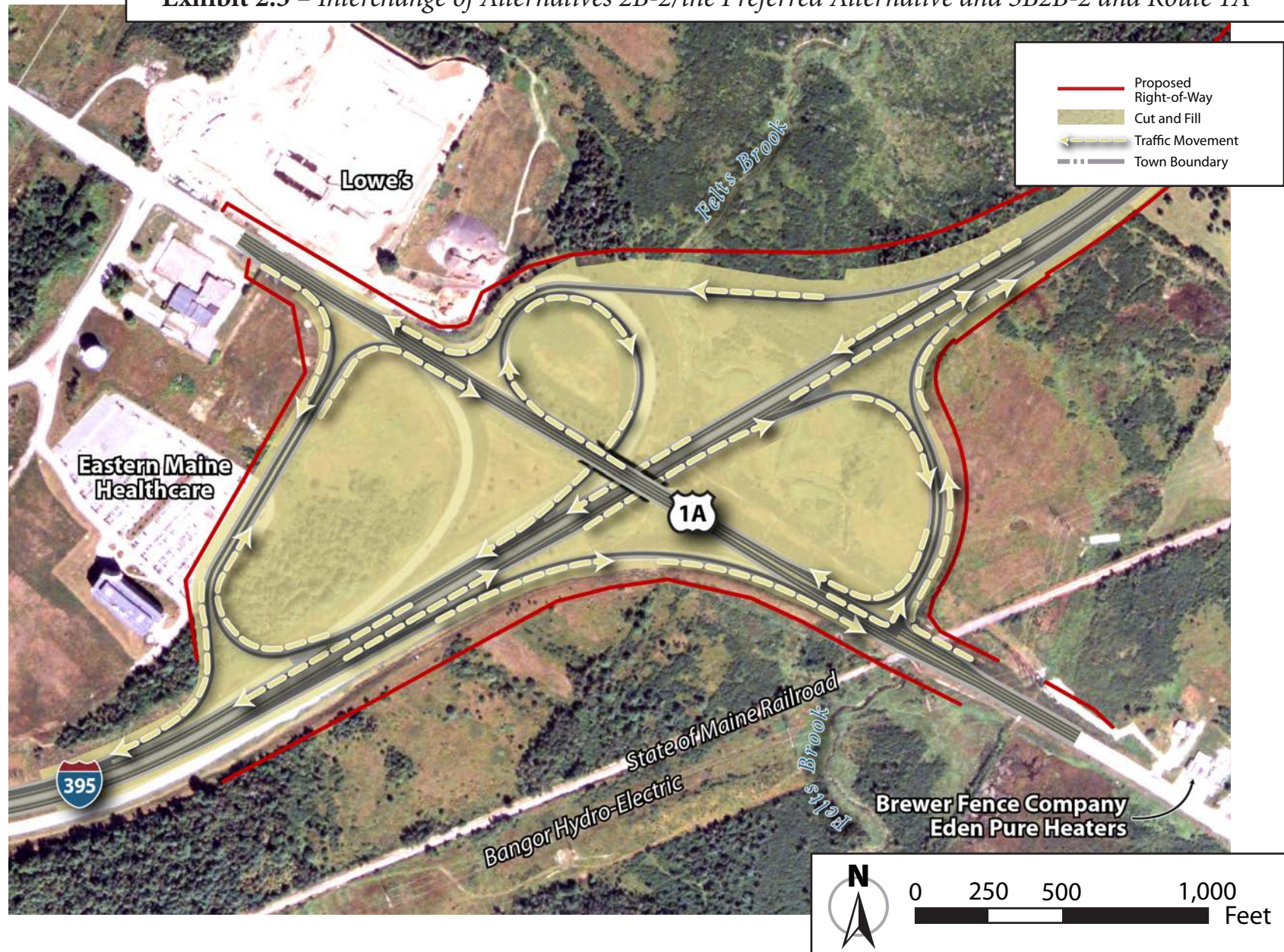
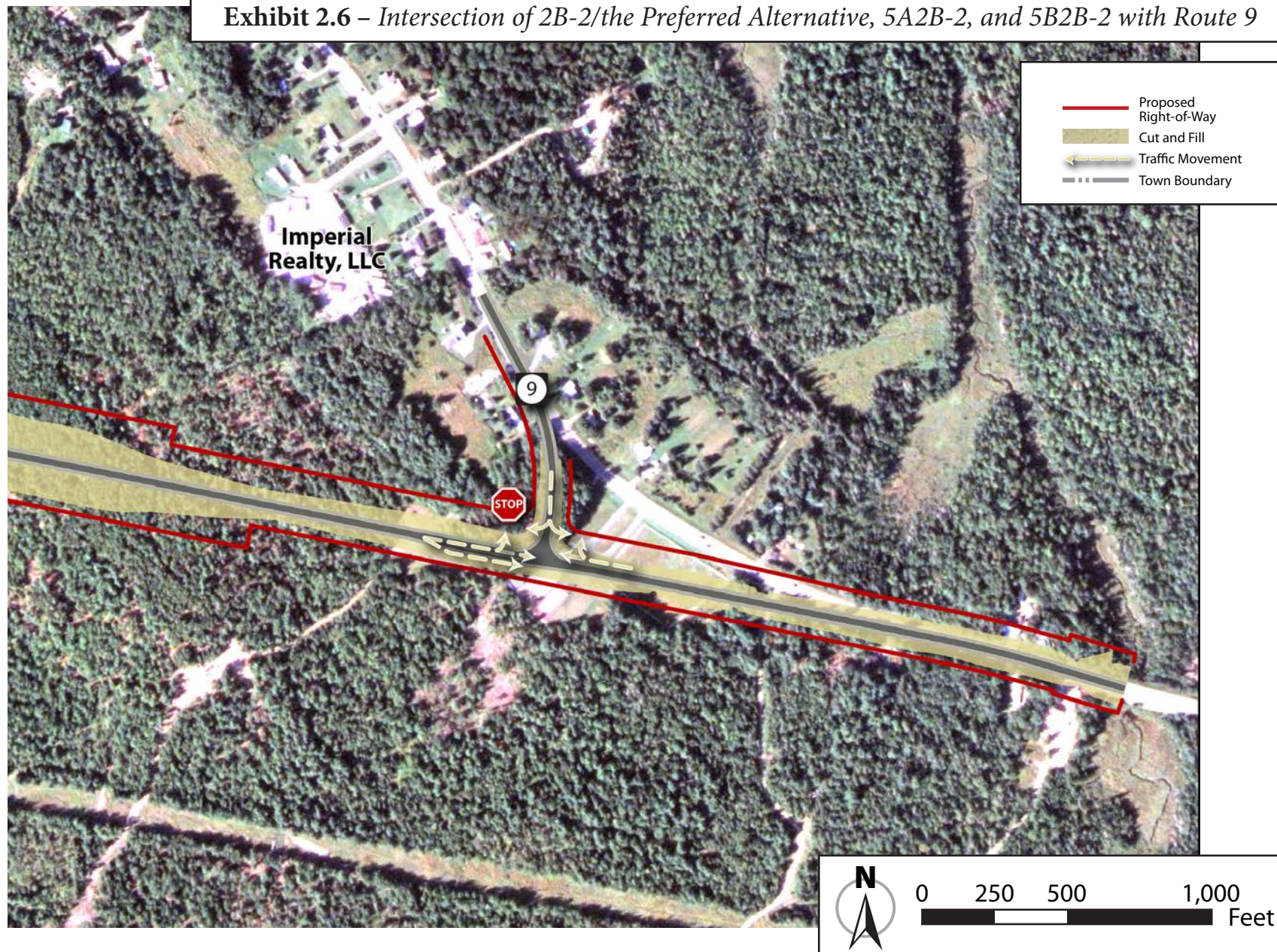


Exhibit 2.6 – Intersection of 2B-2/the Preferred Alternative, 5A2B-2, and 5B2B-2 with Route 9



2.3.3 Alternative 5A2B-2

Alternative 5A2B-2 would start from I-395 for approximately one mile along the southern side of Route 1A in the town of Holden before turning northward, crossing over Route 1A, and paralleling the Bangor Hydro-Electric Company utility easement and connect with Route 9 west of Chemo Pond Road (exhibit 2.7). Route 9 would not be widened to four lanes. Alternative 5A2B-2 would connect to Route 1A with a modified-diamond interchange (exhibit 2.8), which would provide all traffic movements and require two left turns across traffic. A left-turn lane would be provided on Route 1A to 5A2B-2 north. The modified-diamond interchange design would reduce the amount of property that must be acquired. It would connect to Route 9 at a “T” intersection (exhibit 2.6). Route 9 eastbound would be controlled with a stop sign.

Alternative 5A2B-2 would further the study’s purpose and satisfy the system linkage need, in the near term (before 2035). Alternative 5A2B-2 would be a controlled-access highway and conceptually designed using MaineDOT design criteria for freeways. Two lanes would be constructed and used for two-way travel within an approximate 200-foot-wide right-of-way.

Route 9 would not be improved (beyond the improvements necessary to connect the preferred alternative), and it would not provide a high-speed, controlled-access connection to the east of East Ed-dington village. It would satisfy the study need related

to traffic congestion and safety. It would satisfy the USACE’s basic purpose statement.

Alternative 5A2B-2 would require the construction of a new interchange at I-395 and Route 1A in a location with poor soils and the existing interchange would need to be removed. The railroad crossings would be grade separated.

2.3.4 Alternative 5B2B-2

Alternative 5B2B-2 would continue north from the I-395 interchange with Route 1A before turning east and connecting with Route 9 west of Chemo Pond Road (exhibit 2.9). Route 9 would not be widened to four lanes. The existing I-395/Route 1A interchange would be used (to the extent possible) and expanded to become a semi-directional interchange (exhibit 2.5). The only traffic movement that would require a left turn would be Route 1A south to Alternative 5B2B-2 north. This interchange would require more land than a diamond interchange. The land required for the northern portion of the interchange is owned by the State of Maine.

Alternative 5B2B-2 would bridge over Felts Brook in two locations at the I-395 interchange. It would bridge over Eastern Avenue to the immediate east of Lambert Road and bridge over Lambert Road. It would pass under Day Road and Chewleyville Road before turning east and connecting to Route 9 at a “T” intersection (exhibit 2.6). Route 9 eastbound would be controlled with a stop sign.

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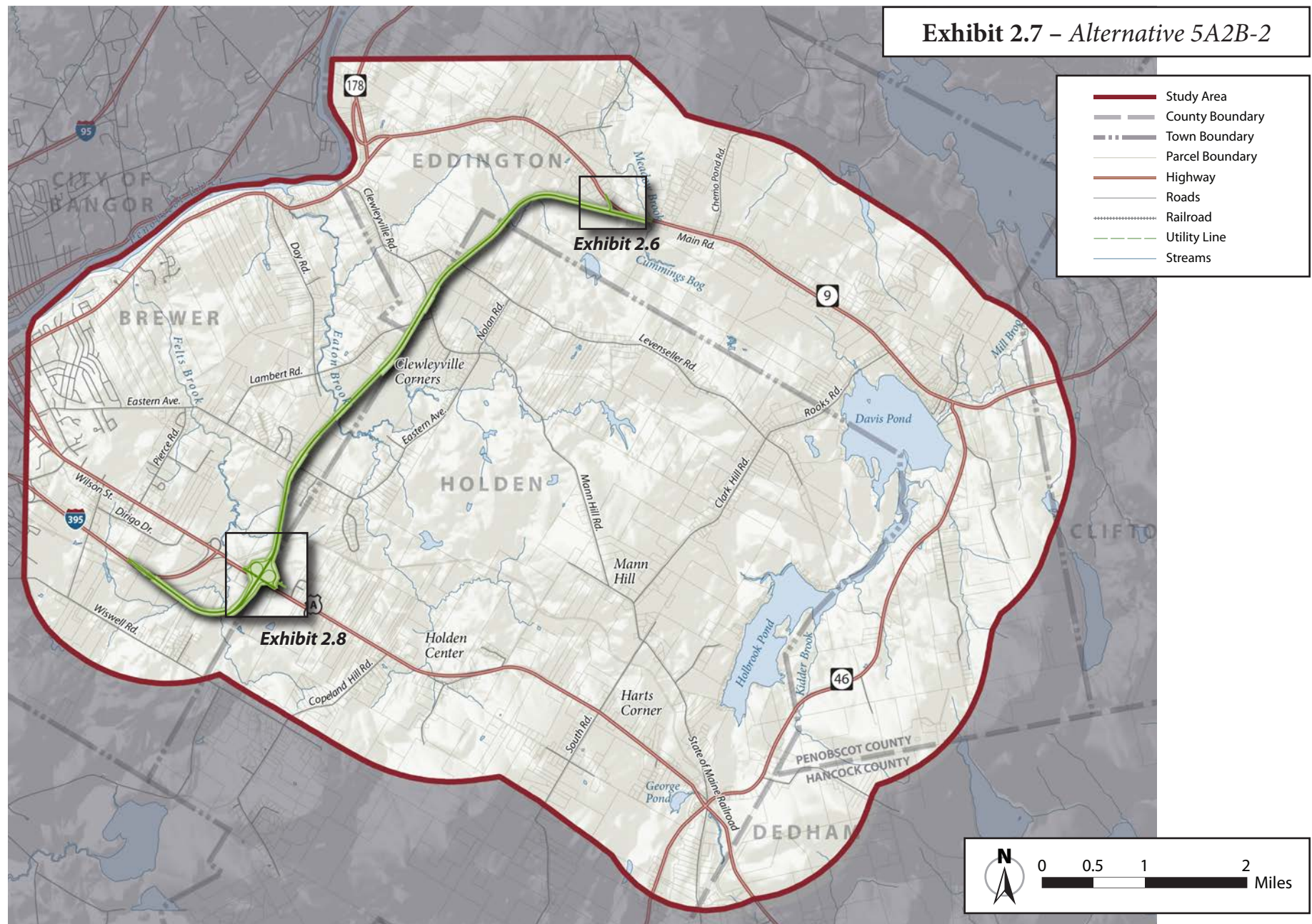
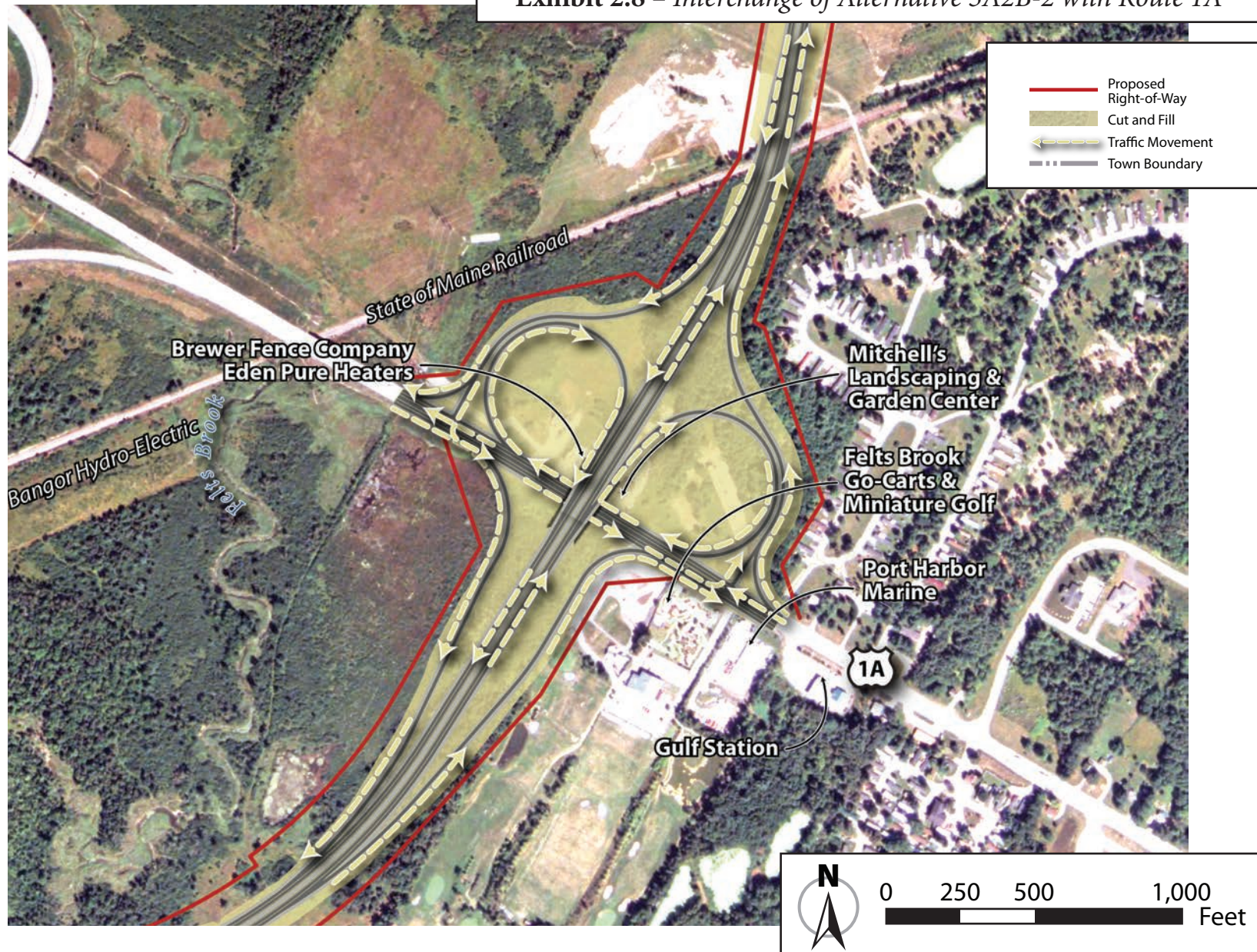
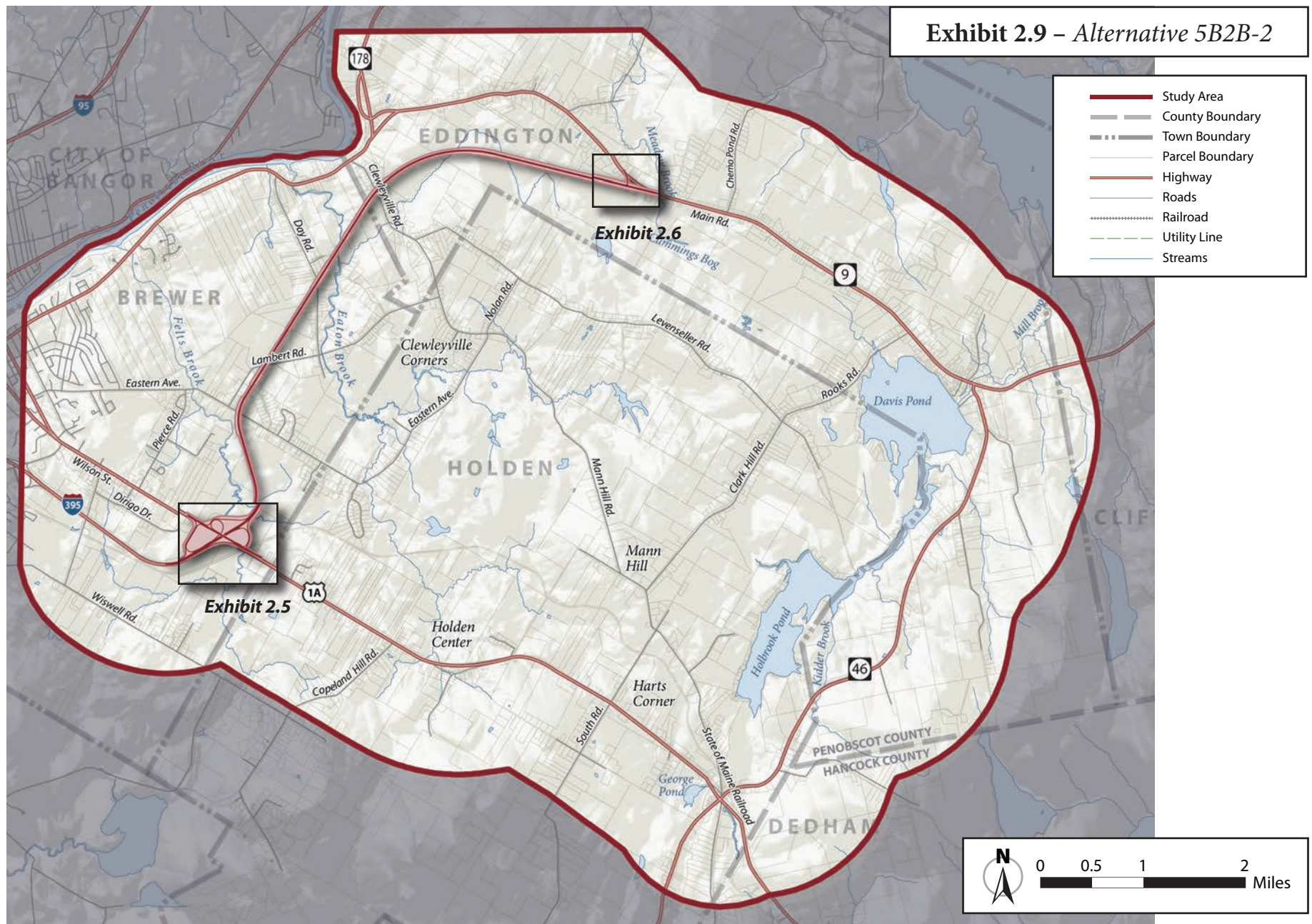


Exhibit 2.8 – Interchange of Alternative 5A2B-2 with Route 1A



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Alternative 5B2B-2 would further the study's purpose and satisfy the system-linkage need in the near term (before 2035). Alternative 5B2B-2 would be a controlled-access highway and conceptually designed using MaineDOT design criteria for freeways. Two lanes would be constructed and used for two-way travel within an approximate 200-foot-wide right-of-way.

Route 9 would not be improved (beyond the improvements necessary to connect the preferred alternative), and it would not provide a high-speed, controlled-access connection to the east of East Eddington village. It would satisfy the study need related to traffic congestion and safety. It would satisfy the USACE's basic purpose statement.

2.4 Other Activities Necessary to Construct Alternative 2B-2/ the Preferred Alternative and Estimated Construction Cost

Each build alternative would require preliminary and final engineering design, acquisition of property, and relocation of utilities prior to construction.

2.4.1 Property to Be Acquired for Alternative 2B-2/the Preferred Alternative

The build alternatives were designed to avoid and minimize the impact to properties.

The conceptual design of the build alternatives included an estimation of land that would need to be acquired and used as a right-of-way for the two-lane highway. The proposed right-of-way width for the build alternatives would be the minimum necessary to accommodate a two-lane highway and averages approximately 200 feet. The limits of the proposed right-of-way are irregular because they are a function of topography, earth-moving activities (i.e., cutting and filling), slopes, existing property boundaries, viability of remaining portions of properties acquired, and continued access to individual properties. The amount of land to be acquired for the construction and operation of the build alternatives would be minimized wherever possible.

A preliminary assessment was performed to provide a general understanding of existing properties and ownership and the extent of potential land to be acquired and used for right-of-ways to construct and maintain the build alternatives. Information was collected from aerial photography and property records from the city of Brewer and the towns of Holden, Eddington, and Clifton. Through analysis of property data, discussions with local officials, and observations, potentially impacted properties within the proposed right-of-ways for each build alternative were identified and quantified. The build alternatives would directly impact 44 to 70 properties. The area to be acquired and

used for right-of-way for the build alternatives ranges 163 to 215 acres (exhibit 2.10). The area to be acquired and used for right-of-way would be in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.

2.4.2 Utilities to Be Relocated

The build alternatives were designed to avoid and minimize the impact and relocation of utilities. Construction of the build alternatives would impact electric, telephone, cable television, water, and sewer utilities.

A preliminary assessment of potential impacts of the build alternatives to utilities and their required relocations was performed. Information on utilities was collected from field inspection, interviews with utility owners and representatives, review of utility records and designs, property maps, and aerial photography.

Individual utility companies would be responsible for the cost of relocating utilities inside the rights-of-way of state roads. MaineDOT would be responsible

for the cost of relocating utilities located outside the right-of-ways of state roads.

2.4.3 Estimated Construction Costs

As part of the conceptual design of the build alternatives, a preliminary estimate of the cost to construct them was prepared (in 2011 dollars). The cost to construct the build alternatives ranges from \$61 million to \$81 million.

MaineDOT investigated tolling as one method of partially financing the operation and maintenance costs of a build alternative. MaineDOT and the Maine Turnpike Authority considered the feasibility of tolling the build alternatives to determine if tolling could generate sufficient revenue to (1) cover the construction, operations, and maintenance costs of a toll facility; and (2) provide funding to supplement the operations and maintenance costs of the build alternatives, if one is selected and advanced to construction. Tolling would not be used to supplement the funding for construction of one of the build alternatives due to the low traffic volumes (HNTB, 2010).

Exhibit 2.10 – Summary of Property to Be Acquired

<i>Alternative</i>	<i>Displacements</i>			<i>Number of Affected Properties</i>	<i>Area to be Acquired (acres)</i>
	<i>Residential</i>	<i>Commercial</i>	<i>Utility</i>		
No-Build	-	-	-	-	-
2B-2/the Preferred Alternative	8	-	-	54	163
5A2B-2	16	4	-	70	215
5B2B-2	6	-	2	44	186

The analysis considered two basic types of tolling facilities: a traditional barrier tolling facility (e.g., the York toll plaza in York, Maine) and an open-road tolling facility (e.g., the Hampton toll plaza in Hampton, New Hampshire). The analysis included the following toll schedule assumptions:

- Passenger-car cash toll rate would be \$1.00 in the opening year
- Heavy-truck cash toll rate would be four times the passenger-car cash toll rate
- E-Z Pass rates would be discounted 10 percent off the cash rate
- Commuter rates would be discounted 50 percent off the cash rate
- Toll increases would occur every five years at an annual inflation rate of 2.7 percent
- Toll rates for cash-paying vehicles would be rounded to the nearest \$0.05

The analysis concluded that a traditional barrier tolling facility could generate revenue to cover the costs associated with the construction, operations, and maintenance costs of a toll facility and generate approximately \$155,000 annually (in 2011 dollars) to supplement the operations and maintenance costs of one of the build alternatives. The analysis further concluded that an open-road toll facility would not generate enough

revenue to cover the construction, operations, and maintenance costs of a toll facility (HNTB, 2010).

Due to the small amount of revenue generated from a toll facility in comparison to the estimated cost of construction, MaineDOT is not considering tolling as a method of partially financing the operation and maintenance costs of a build alternative, if one is selected and advanced to construction.

2.5 Next Steps

After the USACE determination of the LEDPA, completion of an EIS, filing of a ROD by the FHWA, and issuance of a Section 404 permit — MaineDOT would work with the affected municipalities to develop a plan to protect the corridor of Alternative 2B-2/the Preferred Alternative from further development. Methods to protect the corridor include development of zoning and local ordinances and selective acquisition of properties as they become available for sale or at risk for further development. MaineDOT may fund these property acquisitions through its customary programming of state and federal highway-funding mechanisms. Property acquisitions and residential and business relocations would be in accordance with appropriate state and federal laws relevant to acquisition of property for highway purposes.

The acquisition of property for a right-of-way for corridor preservation could begin shortly after the NEPA/Section 404 process is completed. Once MaineDOT has

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a corridor-protection system in place, it would work to develop support for a funding plan. In recent years, many states have found that state highway funds, bonding, and federal core apportionments are needed to maintain the transportation system as it exists, with little in additional funds for new capacity projects. Therefore, MaineDOT would work with the Governor, region, and state and federal legislators to devise funding strategies for the full property acquisition and ultimate construction of Alternative 2B-2/the Preferred Alternative.

MaineDOT would include funding in the DOT's next Statewide Transportation Improvement Plan for design and right-of-way acquisition, (which would be dedicated to protect the selected alternative from further development.) Construction funding would be identified subsequent to the development of design plans for the project. Given that design and right-of-way acquisition would not occur until the next work plan cycle, MaineDOT would not expect to be able to fund construction until the following work plan cycle, at the earliest.

MaineDOT would work with the town of Eddington to maintain the safety and preserve the capacity of Route 9 in the study area. MaineDOT manages access points with Maine's rules governing access management (driveway and entrance siting). Safety, traffic congestion, and system linkage remains a priority concern of MaineDOT, as is preservation of the capacity of the existing highway system. Activities that could be

considered to maintain safety and preserve the capacity of Route 9, in accordance with Maine's rules governing access management (driveway and entrance siting) can go no further than working with the town of Eddington to change zoning, eliminating existing and future curb cuts, and working with individual landowners to acquire property or development rights. That authority already exists to help both MaineDOT and the community ensure that safety is maintained in the corridor. MaineDOT has no authority beyond the existing rules to force Eddington to do anything to help reduce traffic conflicts, but MaineDOT is directed by statute to work with Eddington to ensure safety and proper access to the state highway system.

MaineDOT would work with town officials and evaluate Route 9 for potential improvements to improve safety for pedestrians and bicyclists along Route 9. Providing safe access for pedestrians and bicyclists along the road system typically consists of paved shoulders, sidewalks in highly developed areas, high visibility crossings where warranted, and signage to help alert drivers of the presence of bicyclists and pedestrians on the road system. A road safety audit would be conducted in conjunction with town officials and residents to develop potential immediate and longer term improvements that the town can consider as options to improve safety for pedestrians and bicyclists.

During final design, MaineDOT would continue to refine the alignment and its right-of-way within the preferred corridor to further avoid and minimize impacts to the natural, social, and economic environments and to coordinate with those that are affected.

In addition to construction and operation of Alternative 2B-2/the Preferred Alternative, MaineDOT is committed to improving the most heavily congested section of Route 1A from I-395 to Route 46 and the intersection of Routes 46 and 9. The proposed intersection would be studied and further developed during final design and discussed at a future public meeting.

2.6 Most Essential Differences among the Alternatives to Be Considered in Decision Making

Distinct differences exist in the potential direct and indirect impacts from the build alternatives (exhibit 2.11). They help to define the alternatives and assist MaineDOT and the FHWA in identifying the preferred alternative. A full accounting of the direct, indirect, and cumulative impacts from the No-Build Alternative and the build alternatives to the natural, social, cultural, and economic environments is in Chapter 3.

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Exhibit 2.11 - Impacts of Alternatives

Alternatives	Physical and Biological															Land Use				
	Wetlands (acres)	Roadway contaminants within 100 feet ¹ (acres)	Roadway contaminants within 160 feet ² (acres)	Streams				Floodplains (acres)	Vernal pools ³ / dispersal habitat ⁴ (acres)	Waterfowl and wading bird habitat (acres)	Deer-wintering areas (acres)	Federally-Listed Endangered Species	Vegetation (acres)	Undeveloped habitat	Area to be acquired (acres)	Historic Properties 4(f) Properties	Residential displacements ⁵	Business displacements ⁶	Business impacts ⁷	
				Bridges and culverts/feet	Roadway contaminants within 100 feet ¹ (acres)	Roadway contaminants within 160 feet ² (acres)	Sediments within 3,300 feet ² acres)													
No-Build	-	17	64	-	0.3 ac. (17,000 sq. ft.)	0.7 ac. (29,000 sq. ft.)	12 ac.	-	-	-	-	-	-	-	-	-	-	-	-	
	Impacts from maintenance activities			Impacts from maintenance activities							Impacts from maintenance activities									
2B-2/the Preferred Alternative	26	31	66	5 bridges 1 culvert/ 212 feet	0.9 ac. (39,100 sq. ft.)	1.8 ac. (78,300 sq. ft.)	13 ac.	10	1/17	9 acres along Eaton Brook and its tributaries	-	Yes	103	Eliminates two blocks; fragments three blocks	163	No	No	8	-	-
5A2B-2	31	34	71	5 bridges 1 culvert/ 212 feet	0.6 ac. (24,300 sq. ft.)	1.5 ac. (63,000 sq. ft.)	18 ac.	2	1/25	20 acres along Felts Brook and 9 acres along Eaton Brook	-	Yes	136	Eliminates two blocks; fragments four blocks	215	No	No	16	Brewer Fence Company, Eden Pure Heaters, Mitchell's Landscaping and Garden Center, Town 'N Country Apartments	-
5B2B-2	30	30	80	6 bridges 1 culvert/ 222 feet	1.0 ac. (43,700 sq. ft.)	2.0 ac. (90,000 sq. ft)	17 ac.	11	1/8	3 acres along a tributary to Eaton Brook	3 acres along a tributary to Eaton Brook	Yes	102	Fragments four blocks	186	No	No	6	Bangor Hydro-Electric Co. Building, Maritimes and Northeast Pipeline Compressor Station	-

Notes:

Primary road contaminants are salt and lead.

No-Build Alternative consisted of Route 1A from I-395 to Route 46, and Route 46 from Route 1A to Route 9.

¹Source: USACE New England District, "Compensatory Mitigation Guidance", 2010.

²Source: Maine Audubon Society, "Conserving Wildlife On and Around Maine's Roads", 2007.

³All vernal pools are insignificant.

⁴Upland habitat within 250 ft.

⁵The taking of a residence

⁶The taking of a business

⁷An impact to the business without the taking of the business

Chapter 3

Affected Environment and Environmental Consequences

Chapter 3 is an inventory of the affected environment and a discussion of consequences and potential mitigation measures resulting from the alternatives retained for detailed study. It succinctly describes the physical, biological, social, and economic environments of the area to be affected by the alternatives. It describes the impacts of the alternatives; the adverse effects that cannot be avoided if implemented; the relationship between short-term uses of the human environment and the maintenance and enhancement of long-term productivity; and any irreversible or irretrievable commitments of resources that would result if an alternative is implemented (40 CFR part 1502.16).

3.1 Introduction

The purpose of this section is to introduce new information and present the anticipated impacts of the No-Build, and build alternatives, including Alternative 2B-2/the Preferred Alternative, on the natural, social, and economic environments, as they differ from the

information presented in the DEIS. For impacts that have not changed, the affected environment information is summarized and the reader is referred to the DEIS for a complete description.

A study area of approximately 34,416 acres was identified, and a detailed analysis of the natural, social, and economic features of the study area was performed. The study area covers not only the land that would be used for the build alternatives, but also the areas that would experience direct, indirect, and cumulative impacts from them. The No-Build and build alternatives, including Alternative 2B-2/the Preferred Alternative, would not substantially impact the following resources and features:

- physical geography
- climate
- geological resources
- groundwater
- significant sand and gravel aquifers
- wild and scenic rivers
- state endangered or threatened species
- essential fish habitat (EFH)

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- other protected species
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- traditional cultural properties
- public properties
- population, demographics, and labor force
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3.2 Physical and Biological Environment

3.2.1 Soils

Many different soil types are found in the study area. Certain soil types can be classified as either hydric soils, which are characteristic of wetlands areas, or prime or potential prime farmland soils. Hydric soils are soils that are saturated, flooded, or ponded long enough during the growing season to develop at least temporary conditions in which there is no free oxygen in the soil around roots. Generally, hydric soils correspond closely to wetlands (USDA, 1995). Prime farmland soil has the best combination of physical

and chemical characteristics for producing forage and crops. Soils of statewide importance are defined as "... land, in addition to prime and unique farmlands, that is of statewide importance for the production of food, feed, fiber, forage, and oilseed crop." For a complete description of soils, see DEIS Section 3.1.1.2 Soils.

The No-Build and build alternatives would impact soils and agricultural land (exhibit 3.1), but would not result in a substantial impact to farmland and farming operations. MaineDOT, the FHWA, and the National Resource Conservation Service (NRCS) performed an analysis of the potential impacts of the build alternatives to farmland and farming operations in accordance with the Farmland Protection Policy Act (FPPA); Form NRCS-CPA-106 was completed. The build alternatives result in scores from 49 to 57 of a possible 260. Because the scores for the build alternatives are less than 160, no further coordination is required to demonstrate compliance with the FPPA.

Construction of the build alternatives would require the removal of vegetation and earth-moving activities,

Exhibit 3.1 – Impacts to Soils with Special Status (acres)

<i>Alternative</i>	<i>Hydric Soils</i>	<i>Prime Farmland Soils</i>	<i>Soils of Statewide Importance</i>
No-Build	–	–	–
2B-2/the Preferred Alternative	23 (0.3%)	19 (0.8%)	14 (0.3%)
5A2B-2	24 (0.3%)	14 (0.6%)	34 (0.8%)
5B2B-2	25 (0.3%)	19 (0.8%)	19 (0.4%)

thereby exposing soil to erosive forces. Construction precludes the use of functioning soil for other uses such as native vegetation support. During construction, sediment- and erosion-control procedures to control both coarse and fine sediment would be implemented. These measures would be in accordance with Section II of MaineDOT's *Best Management Practices Manual for Erosion and Sedimentation Control* (MaineDOT, 2008a).

3.2.2 Aquatic Resources

3.2.2.1 Water Resources

The predominant surface water features in the study area are the Penobscot River, Felts Brook, Eaton Brook, Kidder Brook, Meadow Brook, Mill Brook, Davis Pond (also known as Eddington Pond), and Holbrook Pond (exhibit 3.2). The study area is located in the Lower Penobscot River watershed; many sub-watersheds are also located in the study area. For a complete description of the lakes, rivers, creeks, and watershed areas in the study area, see the DEIS Section 3.1.2.1 Water Resources.

The No-Build Alternative would impact surface waters through stormwater runoff and from routine maintenance such as surface and shoulder work; ditch, bridge, and culvert maintenance; and snow and ice removal.

The build alternatives would impact four or five streams; streams would be impacted by bridging them

and enclosing portions in culverts, or both, in one or more locations. The bridges would span the streams and in-stream activity would be temporary and limited to the area of the bridge. The build alternatives would enclose portions of streams in culverts ranging from approximately 212 to 222 feet (exhibit 3.3).

During final design of Alternative 2B-2/the Preferred Alternative, MaineDOT would further evaluate opportunities to shorten the width of road-stream crossings, preserve the natural stream bottoms in the road-stream crossings, and promote passage of aquatic organisms. Stream crossings would be designed in accordance with MaineDOT's Waterway and Wildlife Crossing Policy and Design Guide (MaineDOT, 2008e), except in cases where the drainage is not a stream.

Impervious areas increase the quantity of storm-water runoff and the potential for non-point source pollution. Water from storms that is not absorbed into the ground is discharged into surface waters at higher rates. Higher discharge rates increase the likelihood of contaminants or sediments entering the stream systems and subsequently affecting water quality.

New road-stream crossings increase non-point source discharge during construction and, over the long term, may alter stream and floodplain hydrology. The likelihood that waterborne pollutants would enter surface waters is determined, in part, by the proximity of the new impervious area. Increasing impervious

Exhibit 3.2 – Surface Waters and Wetlands

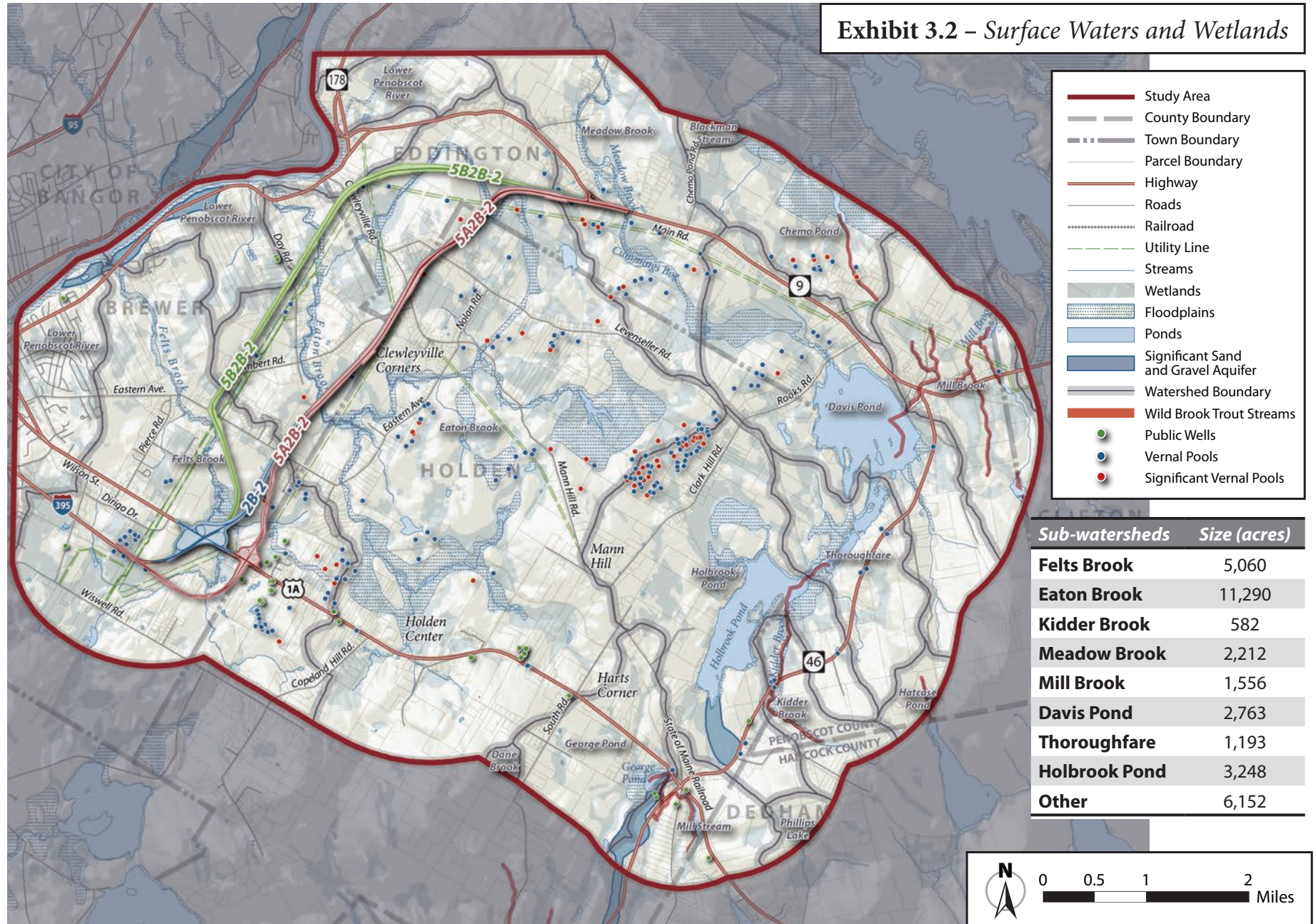


Exhibit 3.3 – Impacts to Streams

<i>Waterway</i>	<i>New Impervious Area (acres)</i>	<i>Unnamed Tributary to Felts Brook</i>	<i>Felts Brook</i>	<i>Unnamed Tributary to Felts Brook</i>	<i>Eaton Brook</i>	<i>Unnamed Tributary to Eaton Brook</i>	<i>Total (number of bridges & number of crossings/feet)</i>
Length (feet)		8,100	33,500	5,800	37,000	19,200	
No-Build							
2B-2/the Preferred Alternative	38		2 bridges - 250 feet	1 bridge - 25 feet	1 bridge - 100 feet	1 bridge - 100 feet 1 culvert - 212 feet, 5-foot diameter	5 bridges - 475 feet 1 culvert - 212 feet
5A2B-2	46	1 bridge - 25 feet	1 bridge - 25 feet	1 bridge - 25 feet	1 bridge - 100 feet	1 bridge -100 feet 1 culvert - 212 feet, 5-foot diameter	5 bridges- 275 feet 1 culvert - 212 feet
5B2B-2	42		2 bridges - 250 feet	1 bridge - 25 feet	1 bridge - 100 feet	2 bridges - 325 feet 1 culvert - 222 feet, 5-foot diameter	6 bridges - 700 feet 1 culvert - 222 feet

*Notes: 25 feet was added to both ends of the road-stream crossing.
Bridges span waters with no in-stream activity.*

areas within 500 feet of a stream may increase peak flow rates of runoff into the stream leading to alteration of the stream morphology. It also reduces the area available to attenuate materials that are washed off the roadway from a storm, which leads to sedimentation and contamination. MaineDOT designs new road-stream crossings in accordance with applicable state and federal regulatory standards relating to aquatic organism passage, primarily by using MaineDOT's Waterway and Wildlife Crossing Policy and Design Guide (MaineDOT, 2008e), except in cases where the drainage is not a stream. The proposed road-stream crossings would span the streams at a width that is 1.2 times the bankful width (i.e., 20 percent larger than a full stream) and use either a bottomless structure or a four-sided

structure with stream simulation design and natural substrate installed (See Appendix C). The substrate inside of the structure would emulate the preexisting substrate of the surrounding stream and banks would mimic terrestrial passage characteristics. Whenever practicable, new road-stream crossings are designed to retain natural stream beds and associated banks to preserve natural stream characteristics and negate the need for stream simulation or engineered passage. Specifications for the road-stream crossings would be part of the final design phase and consider existing conditions, and avoid and minimize impacts to stream habitats.

A short-term increase in the potential for sediment loading to surface waters exists. Impacts from sedimentation caused by construction would be

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temporary. During final design of Alternative 2B-2/the Preferred Alternative, the highway drainage system would be designed to minimize the transport of sediments and other particulates to surface waters. Buffers improve water quality by helping to filter pollutants in run-off both during and after construction. Best management practices would be implemented during and after highway construction to reduce the water quality impacts of stormwater discharges to surface waters. Erosion and sedimentation control measures would be incorporated into the design and implemented during construction in accordance with Section II of MaineDOT's *Best Management Practices Manual for Erosion and Sedimentation Control* (MaineDOT, 2008a) and designed in accordance with the MDEP/MaineDOT/Maine Turnpike Authority Memorandum of Agreement, Stormwater Management, November 14, 2007 and Chapter 500 Rules. MaineDOT understands the potential detrimental effects that winter maintenance initiatives may have on the environment. MaineDOT has worked diligently to ensure cost-efficient efforts are undertaken in a manner that maintains a high level of safety for the traveling public while minimizing impacts to the environment. This is especially true relative to MaineDOT's actions associated with the protection of groundwater. Maine State Law requires that MaineDOT remedy adverse impacts to residential or commercial potable-water supplies

caused by winter maintenance activities; however, it has long been MaineDOT's approach to proactively prevent adverse impacts to water quality in lieu of remediation. Conservatively, MaineDOT uses the secondary drinking water standard established for chloride as the primary indicator of adverse impact.

MaineDOT has a wide array of techniques in its "toolbox" to assist in minimizing impacts to the groundwater regime. Many of the techniques used are detailed in the U.S. Environmental Protection Agency's Source Water Protection Bulletin – Managing Highway Deicing to Prevent Contamination of Drinking Water and include the use of alternative anti-icing chemicals, strategically positioned road weather information systems, properly designed and calibrated application equipment, effective pre-treatment tactics and an aggressive employee training, outreach and education program. Integrated with its pragmatic use of anti-icing chemicals (data consistently shows MaineDOT uses much less anti-icing chemicals per lane mile than other northeastern states), a thoroughly-considered approach to maintaining safe passage for emergency responders, commercial goods and the traveling public in a fiscally prudent and environmentally-sound manner is achieved.

During final design of Alternative 2B-2/the Preferred Alternative, MaineDOT would conduct a Pre-Construction Potable Water Supply Characterization

Assessment prior to construction. This assessment is undertaken to establish a baseline relative to the quality of water extracted from residential and commercial potable water supplies located along the project corridor. Samples are typically collected from water supplies positioned adjacent to the proposed construction and are analyzed for coliform bacteria, nitrate, nitrite nitrogen, fluoride, chloride, hardness, copper, iron, arsenic, manganese, sodium, lead, uranium, pH, color, turbidity and odor. The analytical data is maintained in a state-wide database and is used for comparison purposes should any potential claims arise relative to water supply impacts associated with MaineDOT's construction or long term winter maintenance initiatives.

MaineDOT would be required to meet the General Standards under Chapter 500 to the extent practicable as determined through consultation with and agreement by MDEP. Under the Chapter 500 General Standards for a linear project, MaineDOT would be required to treat 75 percent of the linear portion of Alternative 2B-2/the Preferred Alternative's impervious area and 50 percent of the developed area that is impervious or landscaped for water quality. To meet the General Standards, a project's stormwater management system must include treatment measures that would mitigate for the increased frequency and duration of channel erosive flows due to runoff from

smaller storms, provide for effective treatment of pollutants in stormwater, and mitigate potential temperature impacts.

There are no known receiving waters in the project corridor that have existing issues or impairment related to chloride concentrations.

Additionally, MaineDOT would consider green infrastructure and low-impact development practices such as reducing impervious surfaces, using vegetated swales and revegetation, protecting and restoring riparian corridors, and using porous pavements.

3.2.2.2 Aquatic Habitats and Fisheries

The Penobscot River watershed provides a migratory pathway, feeding area, spawning area, nursery area, and valuable habitat for a variety of fish species, some that are harvested both commercially and recreationally. According to the Maine Department of Inland Fisheries and Wildlife (MDIFW), the Penobscot River watershed serves as a migratory pathway, spawning area, nursery, and feeding area for a variety of diadromous fish species, including the Atlantic salmon, alewife, blueback herring, American shad, American eel, Atlantic sturgeon, shortnose sturgeon, striped bass, sea lamprey, rainbow smelt, and brook trout. Rainbow smelt and alewives are harvested commercially.

The principal game fish species in the study area are lake trout, brook trout, brown trout, smallmouth bass,

largemouth bass, white perch, yellow perch, pickerel, rainbow smelt, hornpout (i.e., brown bullhead), white sucker, pumpkinseed, and redbreast sunfish (Town of Holden, 2007). According to the MDIFW, there are populations of high value eastern brook trout in Felts Brook and Eaton Brook, and populations of non-native invasive black crappie in Eddington and Holbrook Ponds. For a complete description of aquatic habitats and fisheries, see the DEIS Section 3.1.2.2, Aquatic Habitats and Fisheries.

The No-Build Alternative would not impact aquatic habitats or fisheries.

The build alternatives would impact aquatic habitats and fisheries through the road-stream crossing and channelization of streams (exhibit 3.3). Because road-stream crossings with natural bottoms would be used, small amounts of stream channel bottom habitat would be temporarily impacted during construction.

Road-stream crossings can create restrictions or localized changes in flows so that animal movement could be inhibited. MaineDOT's Waterway Crossing Policy and Design Guide (MaineDOT, 2008e) is intended to reduce the likelihood that road-stream crossings would create a barrier to the movement of aquatic organisms. MaineDOT would further evaluate opportunities to shorten the width of road-stream crossings and preserve the natural stream bottoms. Road-stream crossings would be designed in accordance with MaineDOT Waterway and

Wildlife Crossing Policy and Design Guide (MaineDOT, 2008e), except in cases where the drainage is not a perennial stream. Stream crossings would be evaluated for aquatic-organism passage and impacts would be mitigated by providing passage. Stream-bank impacts would be minimized by revegetation.

During final design, MaineDOT would analyze opportunities to further minimize impacts to aquatic habitat and fisheries.

3.2.2.2.1 Magnuson–Stevens Fishery Conservation and Management Act and Sustainable Fisheries Act of 1996.

The 1996 amendments to the Magnuson–Stevens Fishery Conservation and Management Act (Magnuson–Stevens Act) require that an essential fish habitat assessment be conducted for any activity that may adversely affect important habitats of federally managed marine and anadromous fish species. Under Section 303(a)(7) of the Magnuson–Stevens Act, as amended, EFH must be properly described and identified for those species considered under Federal Fishery Management Plans. According to 16 USC 1802(10), EFH is defined as “those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity.” “Waters” refers to the aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas

historically used by fish. “Substrate” refers to sediment, hard bottom, or other underwater structures and their biological communities. The term “necessary” indicates that the habitat is required to sustain the fishery and support the fish species’ contribution to a healthy ecosystem. These regulatory requirements are intended (to the extent practicable) to minimize adverse impacts on habitat caused by fishing or other non-fishing activities, and to identify other actions to encourage the conservation and enhancement of EFH. EFH can be designated for four life stages: eggs, larvae, juveniles, and adults.

In the study area, freshwater Atlantic salmon habitat is the only EFH present (MaineDOT, 2013b).

The No-Build Alternative would not impact EFH.

The build alternatives would impact EFH through the construction of four road-stream crossing and channelization of streams (exhibit 3.3). The road-stream crossings may affect Atlantic salmon during their juvenile stage (exhibit 3.4). Construction of the road-stream crossings increases temporary sedimentation within 600 feet downstream of each crossing that could affect migrating adult salmon. The construction of temporary cofferdams (a temporary enclosure built in or across a body of water and constructed to allow the enclosed area to be pumped out, creating a dry area for construction to proceed) may inhibit Atlantic salmon use of waters for rearing and foraging. The benthic communities of

the streams in proximity to the road-stream crossings would be disturbed during construction.

The proposed crossings would span the streams at a width that is 1.2 times the bankful width (i.e., 20 percent larger than a full stream) and use either a bottomless structure or a four-sided structure with stream simulation design and natural substrate installed. Stream crossings would be designed in accordance with MaineDOT’s Waterway and Wildlife Crossing Policy and Design Guide (MaineDOT, 2008e). An open work window with restrictions for in-stream work would be used to construct the project. If construction must take place outside of the July 15–October 1 work window, fish passage would be maintained through the use of a bypass channel. During final design, MaineDOT would analyze opportunities to further minimize impacts to EFH by considering

Exhibit 3.4 – Managed Species by Life-History Stage

Stage	Atlantic Salmon
Eggs	F/gravel or cobble riffles/below 10° C (50 F)/shallow
Larvae	F/gravel or cobbles/below 10° C (50 F)/shallow
Juveniles	F/shallow gravel and cobbles/below 10° C (50 F)/4 to 20 inches
Adults	F,M,S/ pelagic/oceanic when not returning to spawn
Spawning Adults	F/gravel or cobble riffles/below 10 ° C (50 F)/12 to 20 inches (October and November)

Legend: salinity code/substrate type/water temperature/water depth

S = seawater salinity zone (salinity > 25.0%)

M = mixing water/brackish salinity zone (0.5 < salinity < 25.0%)

F = freshwater salinity zone (0.0 < salinity < 0.5%)

minor shifts in the alignment of Alternative 2B-2/the Preferred Alternative.

The MaineDOT concluded the adverse effect from the construction and operation of Alternative 2B-2/the Preferred Alternative on EFH is not substantial. An EFH Assessment was submitted to NMFS on October 1, 2013 for impacts from Alternative 2B-2/the Preferred Alternative. NMFS responded, in writing, on October 22, 2013 stating they do not have any conservation recommendations at this time.

3.2.2.2.2 Vernal Pools

According to the MDEP, vernal pools or “spring pools” are shallow depressions that usually contain water for only part of the year. It is a natural, temporary, or semi-permanent body of water occurring in a shallow depression that typically fills during the spring or fall and may be dry during the summer. Vernal pools are defined as temporary pools that serve as reproductive habitat for amphibians such as spotted salamanders, blue-spotted salamanders, and wood frogs. Those species breed primarily in vernal pools because the temporary nature of the pools supports invertebrate food sources and discourages colonization of predatory fish.

According to the MDEP, a vernal-pool habitat is considered significant wildlife habitat if it has high habitat value. “Significant vernal pools” are a subset of vernal pools with particularly valuable habitat. The State of

Maine deems that a vernal pool is significant if it meets one of the following criteria. The criteria are:

- It supports a state-listed threatened or endangered species
- It supports abundant egg masses of any one of the following amphibian indicator species: spotted salamanders, blue-spotted salamanders, or wood frogs. (Egg-mass numbers vary with species and were based on extensive surveys of pools throughout Maine.) The abundance criteria on vernal pools being significant is 10 or more egg masses of the blue-spotted salamander, 20 or more egg masses of the spotted salamander, 40 or more egg masses of the wood frog. Egg mass counts are a surrogate of indication of productivity.
- It supports fairy shrimp.

Starting on September 1, 2007, significant vernal pool habitat is protected by law under the NRPA. Development within 250 feet of a significant vernal-pool requires a MDEP permit (MDEP, 2008).

The USACE and federal resource agencies typically use the concentric-circle model with recommended management zones (including 750 feet of “critical terrestrial habitat”) to assess indirect impacts to the critical terrestrial habitat around a vernal pool. This was first introduced in the Calhoun and Klemens (2002) “Best Development Practices Conserving

Pool-Breeding Amphibians in Residential and Commercial Developments in the Northeastern United States” and is mentioned in the USACE New England District’s Compensatory Mitigation Guidance.

There were 251 vernal pools identified in the study area: 55 significant and 196 that do not meet the significant criteria (exhibit 3.2).

For a complete description of vernal pools, see the DEIS Section 3.1.2.2 Aquatic Habitats and Fisheries under the vernal pools heading.

The No-Build Alternative would not impact vernal pools.

The build alternatives would impact/fill one non-significant vernal pool (the same vernal pool for all three build alternatives) and its upland dispersal habitat and wetland habitats (exhibit 3.5). No significant vernal pools would be impacted. The build alternatives may impact upland dispersal habitat and wetland habitats from vernal pools not within the alignments of a build alternative.

The perimeter of vernal pools in and adjacent to Alternative 2B-2/the Preferred Alternative would be reevaluated and identified by MaineDOT during final design. During final design of Alternative 2B-2/the Preferred Alternative, MaineDOT would work to further avoid and minimize impacts to upland dispersal habitat and wetland habitats for vernal pools by considering minor shifts in the alignment of Alternative 2B-2/the Preferred Alternative and increasing the slope of fill material.

3.2.2.3 Floodplains

Federal protection of floodplains is afforded by Executive Order 11988, “Floodplain Management,” and implemented under 44 CFR 9. These regulations direct federal agencies to undertake actions to avoid impacts on floodplain areas by structures built in flood-prone areas. In accordance with these federal directives, the FHWA also enacted federal-aid policy guidance and regulations under 23 CFR 650. The Federal Emergency Management Agency (FEMA) has primary responsibility for identifying flood-prone areas.

Exhibit 3.5 – Impacts to Vernal Pools

Alternative	Number of Vernal Pools	Significant		Dispersal Habitat within 250 feet (ac.)	Dispersal Habitat within 750 feet (ac.)	Total
		Yes	No			
No-Build				54	480	
2B-2/the Preferred Alternative	1		x	17	278	1
5A2B-2	1		x	25	395	1
5B2B-2	1		x	8	146	1

Source: USACE, NEW England District, “Compensatory Mitigation Guidance”, 2010.

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The study area contains land that could be inundated by a flood of a magnitude that has a one percent chance of being equaled or exceeded in any given year (i.e., 100-year floodplain). Approximately 3,322 acres (9.7 percent) of the study area is identified as an area located within the 100-year floodplain (exhibit 3.2). For a complete description of floodplains in the study area, see the DEIS Section 3.1.2.3 Floodplains.

In accordance with Executive Order 11988, Floodplain Management, impacts on floodplains and floodplain encroachments were considered for the No-Build Alternative and the build alternatives. Encroachments are considered significant under Executive Order 11988 if at least one of the following factors is applicable:

- It has a significant effect on natural and/or beneficial floodplain values.
- It would increase the risk of flooding that could result in the loss of life or property.

Exhibit 3.6 – Impacts to Floodplains (acres/percentage)

<i>Alternative</i>	<i>Watersheds</i>		
	<i>Felts Brook</i>	<i>Eaton Brook</i>	<i>Total</i>
No-Build	–	–	–
2B-2/the Preferred Alternative	8	2	10 (0.3%)
5A2B-2	–	2	2 (0.0% ¹)
5B2B-2	8	3	11 (0.3%)

¹Impact to floodplains less than one tenth of one percent.

- It would significantly impact or otherwise disrupt vital services, facilities, or travel routes.

Impacts to floodplains result from:

- reduction of flood storage from filling
- increase in tailwater elevations at road-stream crossings

The No-Build Alternative would not impact floodplains.

The build alternatives would not impact floodplains in the Kidder Brook, Meadow Brook, Mill Brook, the Thoroughfare, Davis Pond, or Holbrook Pond watersheds. The build alternatives would impact two to 11 acres of floodplains with most of the impacts occurring in the Felts Brook watershed (exhibit 3.6).

Floodplains have been avoided to the extent possible. Where impacts could not be avoided, the build alternatives were designed to cross floodplains in remote areas and at the narrowest location practical while avoiding and minimizing impacts to other features. Enclosures have been conceptually designed and placed to minimize impacts to floodplains.

Alternative 2B-2/the Preferred Alternative would not result in a significant impact to floodplains.

During final design, the MaineDOT would work to further avoid and minimize impacts to floodplains by

considering minor shifts in the alignment of Alternative 2B-2/the Preferred Alternative and increasing the slope of fill material that could reduce the amount of fill material placed in floodplains. The road-stream crossings were conceptually designed; detailed hydraulic analysis to size the road-stream crossings would be performed during final design. If during final design, it is determined that there would be lost storage volumes, it would be mitigated.

3.2.2.4 Wetlands

Wetlands are those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (USACE, 1987).

Wetlands were identified using a combination of mapping from the National Wetlands Inventory (NWI), hydric soils determined by the U.S. Department of Agriculture (USDA), the NRCS, and a field reconnaissance of portions of the study area. The NWI is a program administered by the USFWS for mapping and classifying wetlands resources in the United States.

Approximately 10,962 acres (31.9 percent) of the study area is wetlands (exhibit 3.2). Large wetland complexes are located along the Thoroughfare between Davis Pond and Holbrook Pond, at Cummings

Bog south of Route 9, and along the Felts Brook and Eaton Brook stream corridors. For a complete description of wetlands in the study area, see the DEIS Section 3.1.2.4 Wetlands.

In accordance with Executive Order 11990, Protection of Wetlands, agencies shall avoid undertaking or providing assistance for new construction in wetlands unless:

- there is no practicable alternative to such construction
- the proposed action includes all practicable measures to minimize harm to wetlands that may result from its use

Impacts to wetlands result from:

- direct filling of a habitat
- impacts to functions and values
- indirect impacts to wetlands by siltation or hydrologic alterations
- conversion of one habitat to another

The No-Build Alternative would impact wetlands through stormwater runoff and from routine maintenance such as surface and shoulder work; ditch, bridge, and culvert maintenance; and snow and ice removal.

The build alternatives would impact 26 to 31 acres (0.2 to 0.3 percent) of wetlands (exhibit 3.7). The

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Exhibit 3.7 – Impacts to Wetlands by Watershed (acres/percentage)

Alternative	Wetlands Types				Total
	Emergent	Forested	Scrub-Shrub	Unconsolidated Bottom	
Total					
No-Build					
2B-2/the Preferred Alternative	2	21	3		26 (0.2%)
5A2B-2	1.5	23	6	0.5	31 (0.3%)
5B2B-2	1	25	4		30 (0.3%)
Felts Brook Watershed					
No-Build					
2B-2/the Preferred Alternative	1	6	2		9 (0.6%)
5A2B-2	0.5	8	5	0.5	14 (0.9%)
5B2B-2		9	1		10 (0.7%)
Eaton Brook Watershed					
No-Build					
2B-2/the Preferred Alternative	1	12	1		14 (0.4%)
5A2B-2	1	12	1		14 (0.4%)
5B2B-2	1	13	3		17 (0.5%)
Meadow Brook Watershed					
No-Build					
2B-2/the Preferred Alternative		3			3 (0.5%)
5A2B-2		3			3 (0.5%)
5B2B-2		3			3 (0.5%)

approximately 15 to 18 wetlands impacted range from small isolated areas to large, expansive areas comprising hundreds of acres; these wetlands are in the Felts Brook, Eaton Brook, and Meadow Brook watersheds.

Wetlands have been avoided to the extent possible while avoiding and minimizing impacts to other features.

To minimize impacts where further avoidance was not possible, fill material was designed with 1:1 side slopes (2:1 slopes were used when not in proximity to wetlands); MaineDOT would reduce the right-of-way clearing to the minimum necessary and minimize clear zones at wetlands and streams. Wetlands would be delineated and a detailed assessment of the functions provided by these wetlands would be performed during final design of Alternative 2B-2/the Preferred Alternative. During final design, MaineDOT would work to further minimize impacts to wetlands by considering minor shifts in the alignment of Alternative 2B-2/the Preferred Alternative and increasing the slope of fill material that could reduce the amount of fill material placed in wetlands. During final design of Alternative 2B-2/the Preferred Alternative, MaineDOT would continue to coordinate with the federal and state regulatory and resource agencies.

MaineDOT submitted a preliminary Section 404 Permit Application to the USACE for the discharge of fill material into waters of the United States. MaineDOT would prepare and submit an NRPA Permit application to the MDEP during final design of Alternative 2B-2/the Preferred Alternative. MaineDOT would coordinate the identification and development of compensatory mitigation with federal and state regulatory and resource agencies (see section 3.10).

Only Practicable Alternative Finding. In accordance with Executive Order 11990, Protection of Wetlands, MaineDOT and FHWA have avoided wetlands to the extent practicable and there are no practicable alternatives to the proposed action. The proposed action includes all practicable measures to minimize harm to wetlands by avoiding wetlands to the extent possible, using bridges instead of culverts, using bridges that span streams at a width that is 1.2 bankful (i.e., 20 percent larger than a full stream), using oversized culverts, steepening slopes in proximity to wetlands, and crossing wetlands at the narrowest location practicable while avoiding and minimizing impacts to other features.

Based upon the above considerations, it is determined that there is no practicable alternative to the proposed construction in wetlands and the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use.

3.2.3 Vegetation

Forests in Penobscot County are dominated by two forest types: the spruce/fir group and the northern hardwoods group (USDA Forest Service, 2005). The spruce/fir forest type typically consists of species such as red spruce, black spruce, balsam fir, and northern white cedar. Eastern hemlock and white pine are also frequently occurring coniferous species. The northern hardwood forests in Penobscot County are typically dominated by sugar maple, red maple, yellow birch, beech, and poplar. Approximately 28,538 acres of the study area is vegetated, including approximately 22,736 acres (66.1 percent) of forest vegetation. The forested areas consist of approximately 16,894 acres (74.3 percent) of deciduous forest, 5,013 acres (22.1 percent) of mixed forest, and 829 acres (3.6 percent) of coniferous forest. For a complete description of vegetation in the study area, see the DEIS Section 3.1.3 Vegetation.

The No-Build Alternative would impact vegetation through stormwater runoff and from routine maintenance

Exhibit 3.8 – Impacts to Vegetation (acres/percentage)

<i>Alternative</i>	<i>Agricultural</i>	<i>Grassland/ Mowed Grass</i>	<i>Shrub/ Dense Shrub</i>	<i>Deciduous Forest</i>	<i>Coniferous Forest</i>	<i>Mixed Forest</i>	<i>Total</i>
No-Build							
2B-2/the Preferred Alternative	14	6	11	64	0 ¹	8	103 (0.4%)
5A2B-2	15	7	29	69	0 ¹	16	136 (0.5%)
5B2B-2	20	6	18	57	0	1	102 (0.4%)

Note: ¹ Impact less than a half-acre.

such as surface and shoulder work; ditch, bridge, and culvert maintenance; mowing, brush control and other vegetation management; and snow and ice removal.

The build alternatives would impact 102 to 136 acres (0.4 to 0.5 percent, respectively) of vegetation (exhibit 3.8). Deciduous forests would be impacted to a greater extent than other general types of vegetation. The total amount of vegetation in the study area impacted by each build alternative is less than one percent.

The build alternatives may create an opportunity to introduce invasive species to the study area. Roadside erosion-control plantings, drainage ditches, maintenance and construction fill, automobiles and boats traveling from areas infested by invasive species, and animals traveling along roadways provide a means for invasive species to disperse. Roadside erosion into wetlands and streams allows invasive species to gain a foothold as native vegetation is scoured or smothered by eroding soils. MaineDOT plants only native species on construction sites to reduce the spread of invasive species.

Some invasive species are damaging to ecosystems to which they are introduced; others negatively affect agriculture and other human uses of natural resources or impact the health of both animals and humans. Common invasive species found in Maine are oriental bittersweet, Japanese knotweed, Norway maple, multiflora rose, and Morrow's honeysuckle.

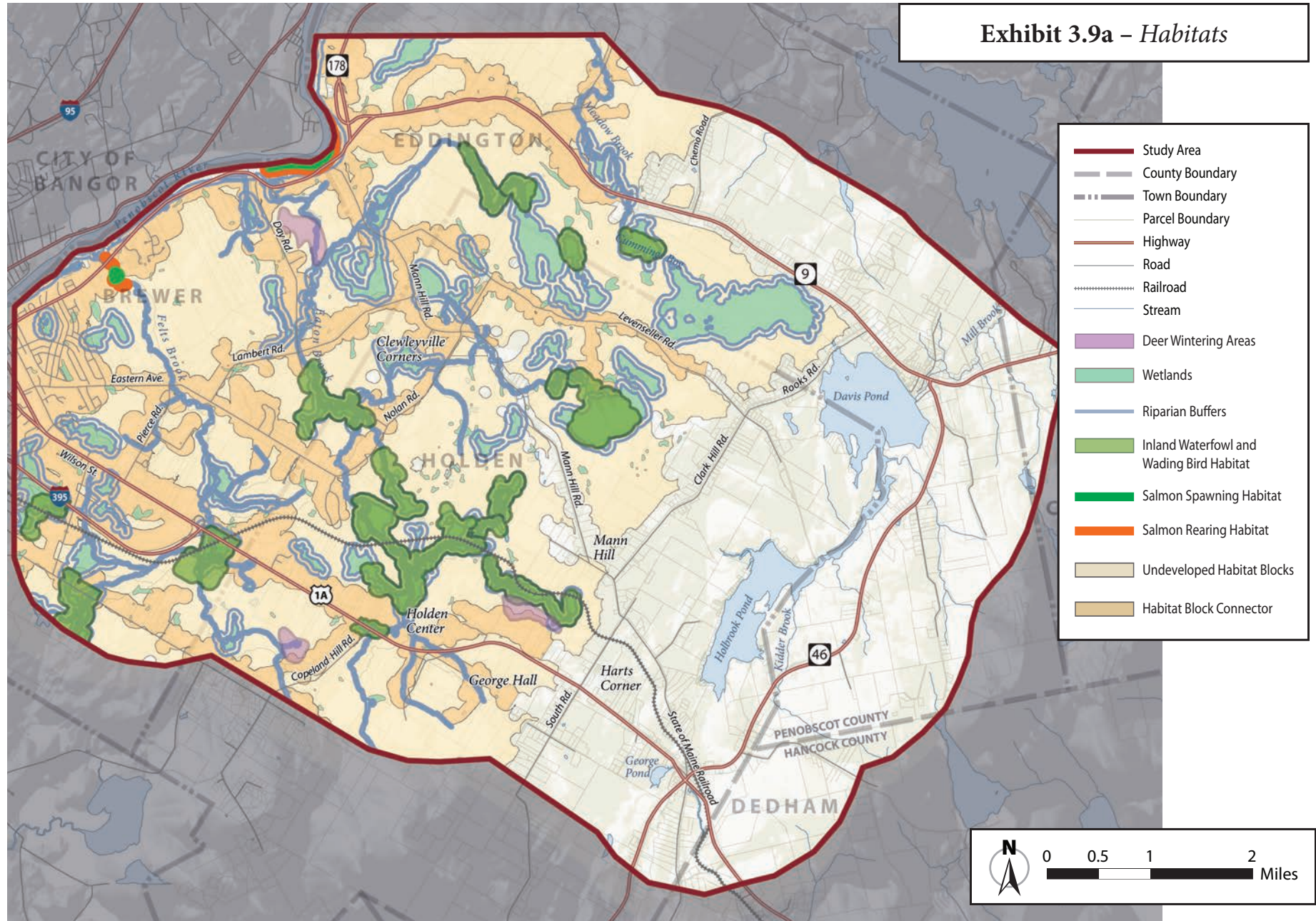
3.2.4 Wildlife Habitats and Wildlife

Approximately 28,538 acres (83%) of the study area is wildlife habitat. These areas contain forests, grasslands, wetlands, and agricultural fields.

3.2.4.1 Wildlife Habitats

Beginning with Habitat, a collaborative program of federal, state and local agencies and non-governmental organizations, is a habitat-based approach to conserving wildlife and plant habitat on a landscape scale. Beginning with Habitat provides maps and information about important habitat features to help promote habitat conservation in local land use planning and decisions (exhibit 3.9a).

Undeveloped habitat blocks are defined by the Beginning with Habitat program as blocks of wildlife habitat that are undeveloped, typically not affected by intense human development, more than 100 acres in size, and outside a 500-foot buffer from improved roads. There are 20 blocks of undeveloped habitat in the study area according to the Beginning with Habitat program. The undeveloped habitat blocks were analyzed with the two Bangor Hydro-Electric Company utility easements as features fragmenting habitat. Some of these blocks extend beyond the study area. The total acreage of undeveloped habitat blocks in their entirety is approximately 182,000. The 20 undeveloped habitat blocks range in size from 103 to 108,216 acres.



Source: Beginning with Habitat, 2013

Note: Beginning with Habitat data not available for entire study area

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The study area has an abundance of wildlife and a diverse range of habitats for this wildlife. This level of abundance and diversity has been supported by the large areas of forested and undeveloped land and the many riparian and wetland habitats that link these larger areas. For a complete description of wildlife habitat, see the DEIS Section 3.1.4.1 Wildlife Habitat.

The No-Build Alternative would not result in additional impacts to wildlife and wildlife habitat (exhibits 3.8 and 3.9).

The build alternatives would impact wildlife through the conversion of wildlife habitat to transportation use and the fragmentation of habitat into habitat blocks of smaller size. The build alternatives would impact 88 to 121 acres of wildlife habitat through conversion to transportation use.

The build alternatives would be controlled-access highways with fencing along the limits of the land to be acquired and used for right-of-way. The build alternatives would impact wildlife through restricting their movement and degrading the habitat adjacent to the proposed rights-of-way of the build alternatives. Fencing along the rights-of-way of the build alternatives would reduce wildlife highway mortality but would not eliminate it.

Undeveloped habitat blocks consist of various habitat types that are home to species less tolerant or intolerant of disturbance and those that would use a

mixture of habitats. These areas are larger than 100 acres in size and serve as habitat for animals that require a variety of habitat types during their lifespan. Animal passage and habitat connectivity within an undeveloped habitat block would be impacted by the placement of a build alternative.

The build alternatives would impact wildlife habitat through fragmentation, which is the subdivision of larger continuous tracts of habitat into smaller tracts. Impacts to undeveloped habitat blocks more than 100 acres in size were evaluated. Because an undeveloped habitat block is defined as 500 feet from a public road or development, direct impacts include areas converted to and within 500 feet of transportation use. The Bangor Hydro-Electric Company utility easements were considered as features that fragment habitat but were not buffered by 500 feet because most of the two easements are vegetated with trees, shrubs, and grass that is mowed occasionally.

Impacts are considered minor when the reduction in areas is in a narrow or otherwise lower value portion of undeveloped habitat block. Impacts are considered moderate when the existing undeveloped habitat block is reduced in area but remains larger than 100 acres and is not bisected. Severe impacts occur when the existing undeveloped habitat block is bisected into smaller habitat areas with one or more remnants smaller than 100 acres in size (exhibit 3.9b).

Although the build alternatives were designed to minimize impacts to undeveloped habitat blocks, they would fragment habitat into smaller tracts (exhibits 3.10a, b, and c). The impacts range from minor to severe. The coniferous and mixed forest areas provide some winter thermal cover for wildlife that would be reduced by the build alternatives. The diversity and quality of habitat adjacent to the right-of-way for the build alternatives would be reduced through the traffic operation and maintenance activities.

The build alternatives would have two wildlife passage structures, large enough to pass moose, on both sides of Eaton Brook. The locations were chosen because they are in a remote area with abundant wildlife. The wildlife passage structures would not be located in wetlands to avoid the bottoms from freezing during the winter.

Exhibit 3.9b – Impacts to Undeveloped Habitat with Utility Easements as Fragmenting Features (acres)

<i>Alternative</i>	<i>A</i>	<i>F</i>	<i>I</i>	<i>J</i>	<i>M</i>	<i>M1</i>	<i>N</i>	<i>P</i>	<i>P1</i>	<i>Q</i>	<i>Total</i>
	720	349	1,194	316	291	157	115	2,011	626	108,216	
No-Build											
Total impact											
Remnants after impact											
2B-2/the Preferred Alternative											
Total impact		148		316	2		115	62	183	3	829
Remnants after impact		203			289			141 1,808	443	108,213	
5A2B-2											
Total impact	130	69		316	2		115	62	183	3	880
Remnants after impact	590	280			289			141 1,808	443	108,213	
5B2B-2											
Total impact		134	58			47			270	3	512
Remnants after impact		102	116	1,136		110			158	198	108,213

Exhibit 3.10a – Impacts to Undeveloped Habitat with Alternative 2B-2/the Preferred Alternative

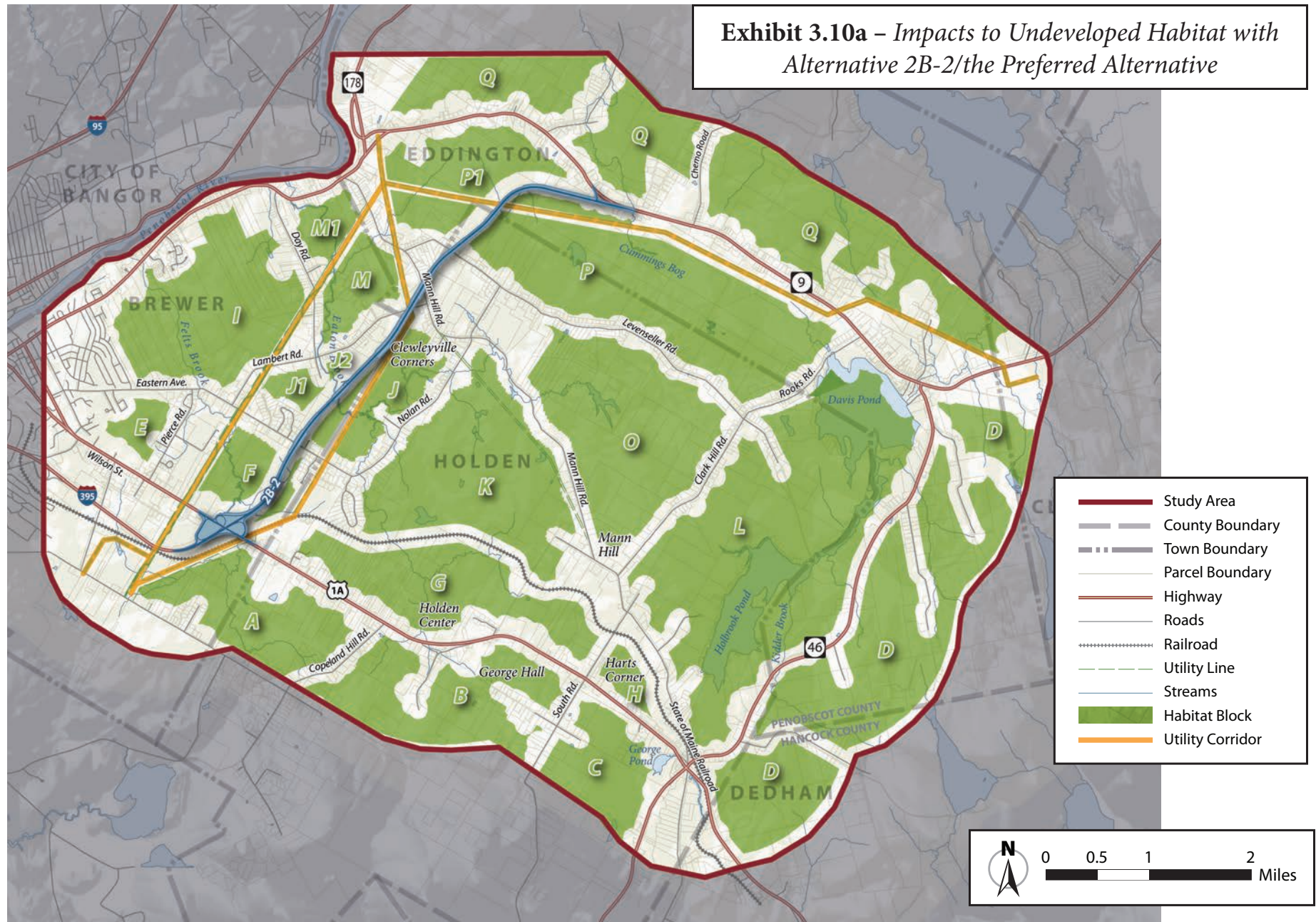


Exhibit 3.10b – Impacts to Undeveloped Habitat with Alternative 5A2B-2

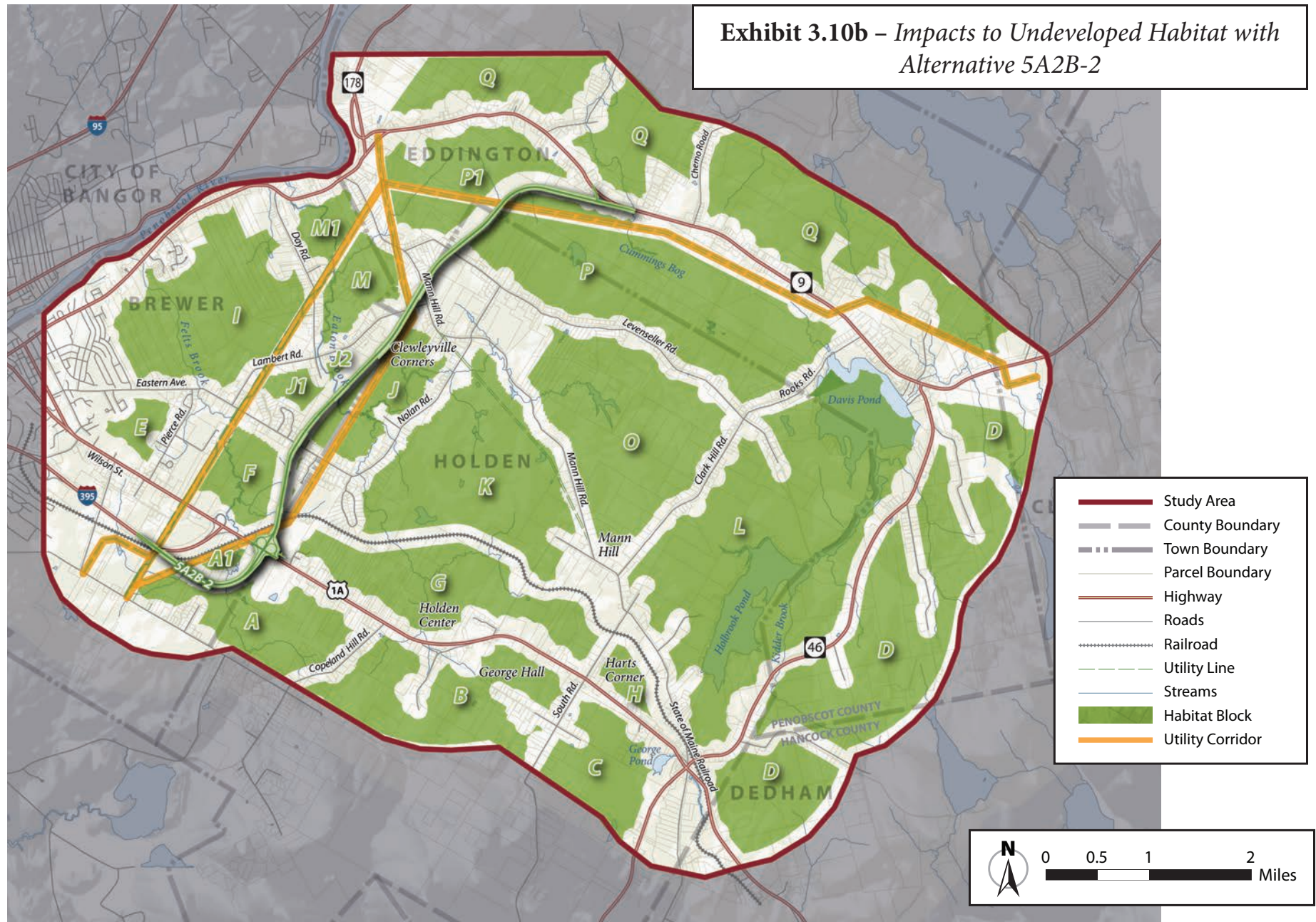
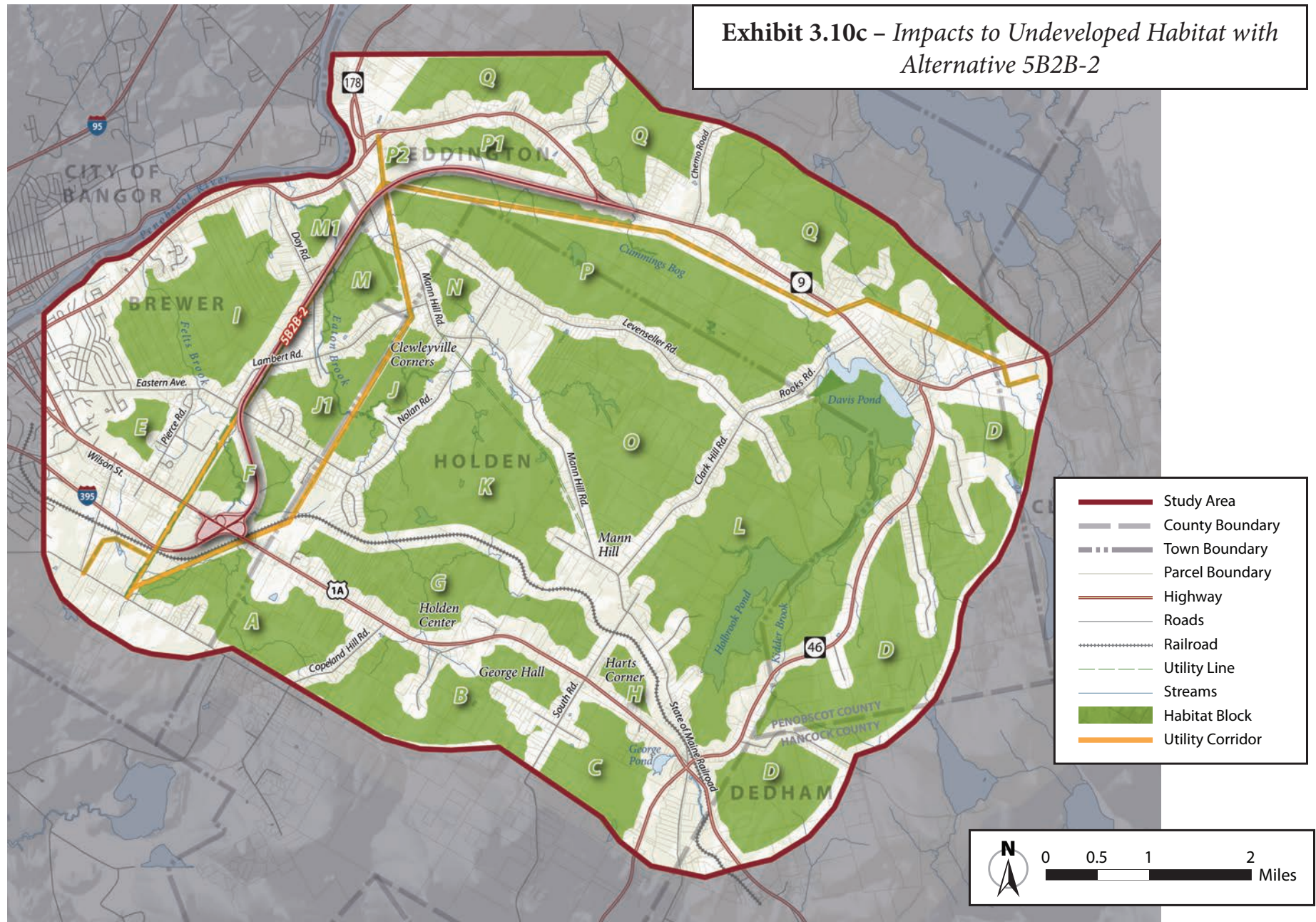


Exhibit 3.10c – Impacts to Undeveloped Habitat with Alternative 5B2B-2



3.2.4.2 Regulated Wildlife Habitat and Significant Habitats Protected under the NRPA

The Maine NRPA, administered by the MDEP, provides protection for certain natural resources, including significant wildlife habitats (38 MRSA 480B). Under the NRPA, habitats defined as “significant” and subject to protection include the following:

- habitat for federal- or state-listed endangered or threatened animal species
- high- and moderate-value deer-wintering areas and travel corridors
- critical spawning and nursery areas for Atlantic sea-run salmon, as defined by the Maine Atlantic Salmon Commission (MASC)

The following are further defined in Chapter 335 rules in 06 Code of Maine Rule 96:

- high- and moderate-value waterfowl and wading-bird habitats, including nesting and feeding areas
- shorebird nesting, feeding, and staging areas
- seabird nesting islands
- significant vernal pools

Under the NRPA, the MDIFW is responsible for defining the high- and moderate-value deer-wintering areas; waterfowl and wading-bird habitats; shorebird nesting, feeding, and staging areas; and seabird nesting islands. For a complete description of regulated wildlife habitat and significant habitats, see the DEIS

Section 3.1.4.2 Regulated Wildlife Habitat and Significant Habitats Protected under the NRPA.

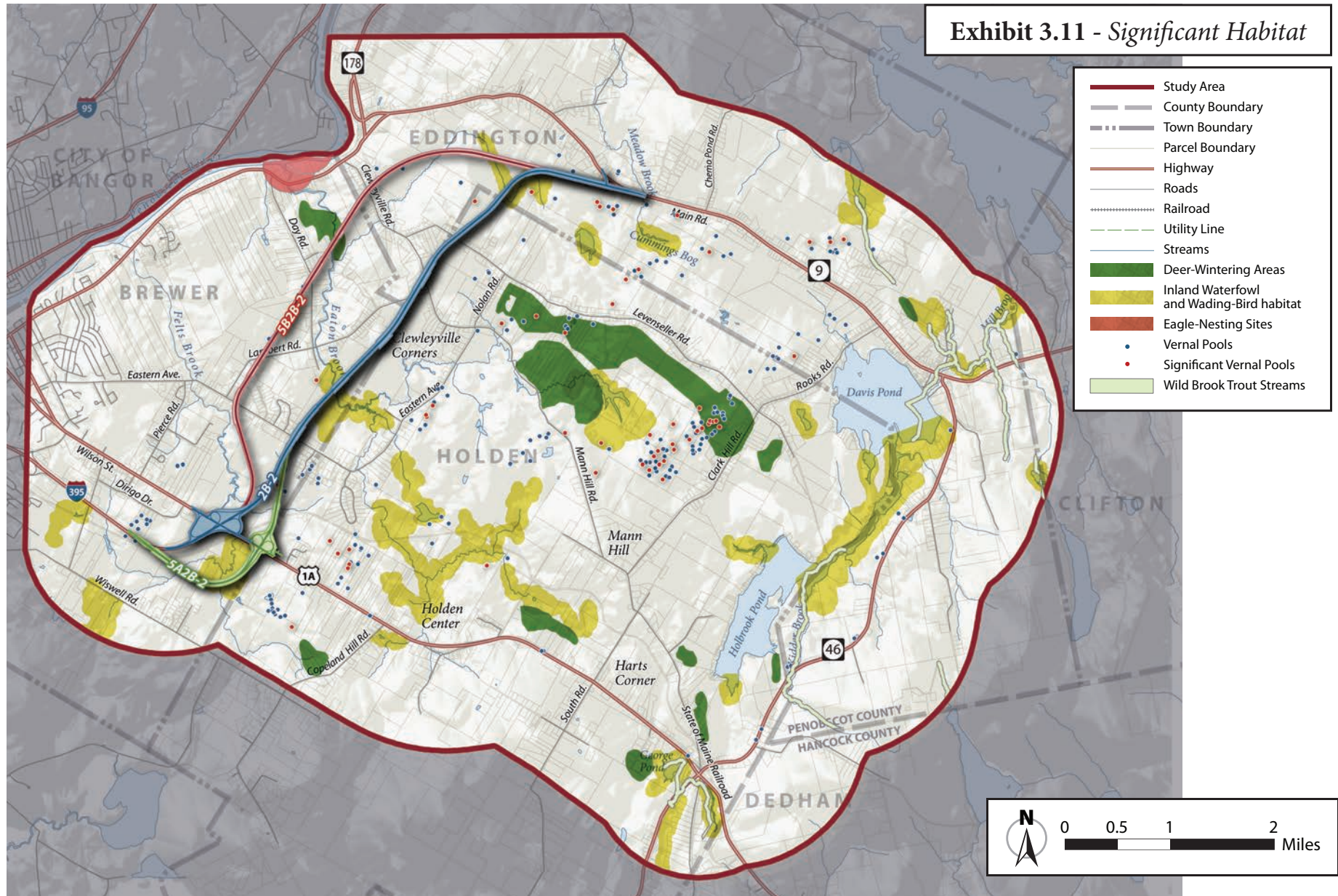
Deer-wintering areas (DWAs), or deer “yards,” are critical to the survival of deer over the winter months. The MDIFW identifies and defines DWAs as stands of mature conifers with a tree height greater than 30 feet and crown closure greater than 60 percent (Beginning with Habitat, 2008). Eleven DWAs totaling 1,051 acres exist in the study area (exhibit 3.11).

The No-Build Alternative, Alternative 2B-2/the Preferred Alternative, and Alternative 5A2B-2 would not impact DWAs. Alternative 5B2B-2 would impact three acres (0.3 percent) of DWAs (exhibit 3.12).

The high- and moderate-value inland waterfowl and wading-bird significant habitat areas are used by waterfowl, members of the family Anatidae including brant, wild ducks, geese, swans, and wading birds such as herons, glossy ibis, bitterns, rails, coots, and common moorhens. Waterfowl use portions of the study area for feeding, breeding, and staging areas; organisms on which they feed use the habitat for food supplies. These habitats are highly productive and are recognized as a valued resource.

Approximately 2,877 acres of IWWH are in the study area: along Felts Brook, Eaton Brook, and the Thoroughfare between Holbrook Pond and Davis Pond (MDIFW, MGIS, 2009). These areas are classified as significant wildlife habitat by the MDIFW.

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Note: Only vernal pools near the corridors for alternatives were identified.

Note: Under the NRPA, habitats defined as “significant” and subject to protection include the following: habitat for federal- or state-listed endangered or threatened animal species, high- and moderate-value deer-wintering areas and travel corridors, and critical spawning and nursery areas for Atlantic sea-run salmon, as defined by the Maine Atlantic Salmon Commission (MASC). The following are further defined in Chapter 335 rules in 06 Code of Maine Rule 96: high- and moderate-value waterfowl and wading-bird habitats, including nesting and feeding areas, shorebird nesting, feeding, and staging areas, seabird nesting islands, and significant vernal pools.

Exhibit 3.12 – Impacts to State-Regulated Wildlife Habitat

<i>Alternatives</i>	<i>DWA</i>	<i>IWWH</i>
No-Build		
2B-2/the Preferred Alternative		9 acres (0.3%) along Eaton Brook and its tributaries
5A2B-2		20 acres (0.7%) along Felts Brook near the proposed interchange and 9 acres (0.3%) along Eaton Brook
5B2B-2	3 acres (0.3%) along a tributary to Eaton Brook	3 acres (0.1%) along a tributary to Eaton Brook

The No-Build Alternative would not impact IWWH.

The build alternatives would impact three to 20 acres (0.1 and one percent respectively) of IWWH(exhibit 3.12).

Beginning on September 1, 2007, significant vernal pool habitat is protected by law under the NRPA (section 3.2.2.2.2) (MDEP, 2010).

The No-Build Alternative would not impact vernal pools.

The build alternatives would impact one non-significant vernal pool and its upland dispersal habitat (exhibit 3.5). The build alternatives may impact upland dispersal habitat from vernal pools not within the alignments of a build alternative.

3.2.5 Endangered and Threatened Species

There are species and critical habitat in the state that receive federal and state protection to help repair previous damage to populations and attempt to return a species population to self-sustaining levels.

Other species receive state protection if the limits of their distribution ranges are in Maine or if populations

can exist only in a specific but uncommon habitat in Maine.

The Federal ESA, as amended (16 USC 1531 et seq.), provides protection for those species that are listed as endangered or threatened under the ESA. Section 7 of the ESA requires that the USFWS and/or the NMFS work with the federal action agencies to achieve conservation and recovery of listed species. “Critical habitat” is a term defined and used in the ESA to designate a specific geographic area(s) that is essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but would be needed for its recovery.

According to the Maine Natural Areas Program, there are no rare botanical features that would be disturbed within the study area (MNAP, 2012).

3.2.5.1 Federal Endangered and Threatened Species

According to the NMFS, there are three species of diadromous fish in the study area listed under the ESA.

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These species are the Atlantic sturgeon, which is listed as a threatened species, the shortnose sturgeon, which is listed as an endangered species, and the Atlantic salmon, which is listed as an endangered species with designated critical habitat in the study area (NOAA, NMFS 2012).

In accordance with the January 2014 Section 7 Programmatic Agreement between FHWA, USACE, MaineDOT, USFWS and NMFS, MaineDOT determined that while the federally threatened Atlantic sturgeon and federally endangered shortnose sturgeon are known to occur within the study area, they are not present within the action area and therefore, determined the proposed action would not have an effect on these species. Also in accordance with the Section 7 Programmatic Agreement, MaineDOT determined that Atlantic salmon and its designated critical habitat were present within the study area and the action area and therefore, would require consultation with the USFWS.

According to the USFWS, the Canada lynx and its designated critical habitat is not considered to be present in the study area (U.S. Fish and Wildlife Service, ..., January, 2014).

According to the USFWS, the northern long eared bat (NLEB) was proposed for listing under the ESA on October 2, 2013 (Federal Register Vol. 78, No. 191, pages 61046-61080). Critical habitat for the NLEB is not currently designated. Due to the recent proposed

listing, MaineDOT, on behalf of the FHWA, is conferencing with the USFWS. Other than the NLEB interim conference and planning guidance (USFWS, 2014), the USFWS has not developed guidance regarding avoidance and minimization measures and are currently developing known life history data gaps in Maine. The NLEB is dependent on forests, using trees as summer and maternity roosts (Federal Register Vol. 78, No. 191, pages 61046-61080). Specific NLEB summer and maternity roost location information is unavailable for Maine, but USFWS asserts that NLEB roosts occur throughout the entire state and, therefore, could be present in the study area. Only three winter hibernacula (a place in which an animal seeks refuge) are known for NLEB in Maine. These hibernacula occur in northern and western Maine.

The Rufa red knot was proposed for listing as a threatened species by the USFWS on September 30, 2013. It is a medium-sized shorebird belonging to the sandpiper group that spends much of its life in migration between its breeding and wintering grounds. During the spring and fall migrations, red knots use staging and stopover areas to rest and feed, including areas along the Maine coast. Currently, no mapping of the Rufa red knot in Maine exists. The MDIFW monitors the species (U.S. Fish and Wildlife Service, ..., January, 2014).

The No-Build Alternative would not impact known federal, listed or proposed threatened species.

The build alternatives are in the geographic range of the Gulf of Maine Distinct Population Segment (GOM DPS) of endangered Atlantic salmon and designated critical habitat for the Atlantic salmon. The Penobscot River, located on the western boundary in the study area, is in the known range of Atlantic sturgeon and shortnose sturgeon. Because the build alternatives would not directly or indirectly impact the Penobscot River, all of the build alternatives, including 2B-2/the Preferred Alternative, would have no effect on the Atlantic sturgeon and the shortnose sturgeon.

The build alternatives may affect Atlantic salmon and its designated critical habitat through the construction of road-stream crossing and channelization of streams. The road-stream crossings may affect Atlantic salmon during their juvenile stage (section 3.2.2.2.1). The proposed crossings would span the streams at a width that is 1.2 times the bankful width (i.e., 20 percent larger than a full stream) and use either a bottomless structure or a four-sided structure with stream simulation design and natural substrate installed. The substrate inside of the structure would emulate the preexisting substrate of the surrounding stream and banks would mimic terrestrial passage characteristics.

Stream crossings would be designed in accordance with MaineDOT's Waterway and Wildlife Crossing Policy and Design Guide (MaineDOT, 2008e). An open work window with restrictions for in-stream work would be used to construct the project. If construction must take place outside of the July 15-October 1 work window, fish passage would be maintained through the use of a bypass channel. During final design, MaineDOT would analyze opportunities to further minimize impacts to designated critical habitat by considering minor shifts in the alignment of Alternative 2B-2/the Preferred Alternative. An increase in the potential for sediment loading and roadway contaminants introduced to surface waters (including those that contain Atlantic salmon) exists for the build alternatives. Impacts from sedimentation caused by construction would be temporary. During final design, a highway drainage system would be designed to minimize the transport of sediments and other particulates to surface waters. Erosion and sedimentation control measures would be incorporated into the design and implemented during construction in accordance with Section II of MaineDOT's *Best Management Practices Manual for Erosion and Sedimentation Control* and designed in accordance with the MDEP/ MaineDOT Memorandum of Agreement, Stormwater Management, November 14, 2007 and Chapter 500 Rules. Redundancy of controls would be

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included in each watershed that would be impacted to minimize potential control failures that could deliver sediment laden runoff to streams. The build alternatives would not impact other known federal, listed or proposed, endangered and threatened species.

MaineDOT prepared a Biological Assessment (BA) for the FHWA for the proposed action in compliance with Section 7 of the ESA. FHWA formally consulted with the USFWS under Section 7 of the ESA for effects of eight proposed crossings of perennial and intermittent streams for Alternative 2B-2/the Preferred Alternative on Atlantic salmon, Atlantic salmon designated critical habitat and the NLEB. One of these crossings is approximately 2,000 feet upstream of a historically inaccessible natural barrier and would have no permanent or temporary effects on Atlantic salmon or Atlantic salmon designated critical habitat. The scope of the BA is based on field measured and U.S. Geological Survey (USGS) regression analysis

to determine bankful widths. In addition, because final design for Alternative 2B-2/Preferred Alternative has not started, final plans, sizes, and types of crossing structures have not been determined (MaineDOT, 2013a).

The BA concluded that because the Penobscot River would not be affected directly or indirectly by the build alternatives, there would be no effect on Atlantic sturgeon and shortnose sturgeon (exhibit 3.13). However, the build alternatives may affect, and are likely to adversely affect, Atlantic salmon because (exhibit 3.14):

- Installation of cofferdams would have the potential to ‘take’ a species in the area of the project.
- Upstream and downstream passage could be blocked during construction of the crossing structures.

Exhibit 3.13 – Overall Effect Determination for Each Affected Species and Critical Habitat

<i>Jurisdiction</i>	<i>Federal Status</i>	<i>Common Name</i>	<i>Effect determination for Stormwater Runoff</i>	<i>Effect determination for in water work</i>	<i>Effect determination for pile driving</i>	<i>Effect determination for clearing and grading</i>	<i>Overall effect determination for project</i>
USFWS	Endangered	Atlantic salmon	Not likely to adversely affect	Likely to adversely affect	Not likely to adversely affect	Not likely to adversely affect	Likely to adversely affect
USFWS	Endangered	Atlantic salmon Critical Habitat	Not likely to adversely affect	Likely to adversely affect (temporary)	Not likely to adversely affect	Not likely to adversely affect	Likely to adversely affect
NMFS	Endangered	shortnose sturgeon	No effect	No effect	No effect	No effect	No effect
NMFS	Threatened	Atlantic sturgeon	No effect	No effect	No effect	No effect	No effect

Exhibit 3.14 – Summary of Effect Determination of Activities Affecting Atlantic Salmon

<i>Stages</i>	<i>Activity Category</i>	<i>Minimization Measure</i>	<i>Presence/ Exposure listed species</i>	<i>Chemical and physical changes</i>	<i>Biological response</i>	<i>Effect Determination</i>
Construction	Cofferdam installation	Complete evacuation	Yes	None	Yes, temporary displacement	Likely to adversely affect
Construction	Cofferdam/ Bypass channel	Passage will be maintained if work is completed outside of July 15-October 1	Yes	None	No	Not likely to adversely affect
Construction	Pile Driving	Use of Vibratory hammer	Yes	None	Yes, temporary displacement	Likely to adversely affect
Post Construction	Vegetation Removal	Amount Minimized	No	Potential impact on water quality	No	Not likely to adversely affect

The BA concludes that the proposed project would not jeopardize the continued existence of the NLEB for the following reasons:

- The amount of forested clearing represents a very small fraction of forest available to NLEB
- The proposed project is not located near known hibernacula
- The type of project proposed is not one identified by USFWS as being most likely to result in lethal impacts or significant adverse effects to NLEB.

MaineDOT and FHWA are required to and would re-initiate Section 7 consultation with the USFWS when the NLEB and/or its critical habitat become officially listed under the ESA.

The Federal ESA requires that all Federal agencies consult with the USFWS and/or NMFS to determine if

actions of an agency would have any effect on species listed under the ESA and to avoid any actions that may jeopardize the continued existence of the species or result in the destruction or adverse modification of designated critical habitat. The formal consultation process is concluded when USFWS issues a biological opinion (BO) that makes a determination of effect that includes terms and conditions of approval, a statement for potential incidental ‘take’ of the species, and conservation recommendations.

3.2.5.2 USFWS Biological Opinion

New information regarding the NLEB will be available and published in the Federal Register in April 2015 requiring further ESA section 7 consultation for potential effects to the NLEB as a result of the proposed

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action, not previously addressed in the BA or the USFWS's BO.

In the BO issued on September 19, 2014 the USFWS concluded that the I-395/Route 9 connector would not jeopardize the continued existence of the NLEB due primarily to the minimal amount of potentially suitable habitat that would be permanently impacted relative to the total habitat area available range-wide (USFWS, 2014).

After considering the current status of Atlantic salmon and its designated critical habitat, the project's environmental baseline, the effects of the proposed action, and the potential for future cumulative effects in the study area, the USFWS concluded the I-395/Route 9 connector is not likely to jeopardize the continued existence of the Atlantic salmon throughout all or a significant portion of its range. Furthermore, the proposed action is not expected to result in the destruction or adverse modification of critical habitat (USFWS, 2014).

The I-395/Route 9 connector would result in short-term adverse effects to Atlantic salmon and its critical habitat during construction activities. These effects are small in spatial and temporal scope and in some cases would be reversed upon completion of construction. Construction activities are authorized to take up to 40 juvenile Atlantic salmon and no adult Atlantic salmon. Many of the construction-related adverse effects to Atlantic salmon are not expected to result in mortality, but rather temporarily

affect normal behavior through capture and relocation to another part of the stream or blocked access to upstream or downstream habitat that results in temporary disruption of normal activities, such as feeding (USFWS, 2014).

The USFWS concluded that critical habitat, including the habitat upstream of the I-395/Route 9 connector on Felts and Eaton Brooks and their tributaries, would function as suitable and unimpaired after construction is complete and these streams would continue to serve a conservation and recovery role for Atlantic salmon. All life stages should be able to move through the new stream crossing structures and the structures would maintain natural stream channels, given that these structures would be wider than the stream's bankful width and that the properly-sized structure should support a natural stream substrate. Additionally, during the operation and maintenance phase of the I-395/Route 9 connector, stormwater management from new impervious surface areas would be treated in a manner that does not produce adverse thermal effects to critical habitat streams (USFWS, 2014).

To be exempt from the prohibitions of section 9 of the ESA, FHWA, MaineDOT, and all contractors must comply with the following terms and conditions:

1. New impervious surface and discharged stormwater runoff quantity and quality must be treated using best management practices that incorporate

- water infiltration and/or filtration, avoiding direct water discharge into designated Atlantic salmon critical habitat or any surface waterway that subsequently directly discharges into critical habitat, raising stream temperatures above pre-construction conditions.
2. All applicable conservation measures described in the BO will be fully implemented.
 3. Monitoring of best management practices implementation will be conducted to evaluate compliance throughout the construction period. An annual report will be submitted to the USFWS' Maine Field Office each December for the previous November through October construction period.
 4. Site preparation, including cofferdam installation and removal, and temporary access road establishment, will not cause sedimentation and adverse levels of turbid water discharge into streams following erosion and sedimentation control requirements in MaineDOT's *Best Management Practices for Erosion and Sedimentation Control* document.
 5. Migration/movement barrier/delay due to cofferdam placement will be minimized by limiting cofferdam placement to the time necessary to complete instream activities. The cofferdams will be removed within two days of the completion of instream construction.
 6. Instream construction will occur during the low flow period (July 15 to October 1). If MaineDOT determines that any instream construction activity cannot be completed prior to October 1, a bypass channel will be constructed to avoid affecting Atlantic salmon movement in Felts and Eaton Brooks. All bypass channels will be constructed and operating by October 2 to avoid consultation reinitiation.
 7. Hydroacoustic impacts from sheet pile installation (if applicable) will not adversely affect Atlantic salmon. MaineDOT will manage noise producing activities to within noise thresholds described in the BO. Hydroacoustic monitoring will be conducted as described and reports will be submitted to the USFWS two weeks after completing each pile driving activity, including cofferdam completion or installed bridge piles for each bridge.
 8. Disturbance and construction association with crossing structure placement will not adversely affect Atlantic salmon due to instream construction activities occurring within a cofferdam.
 9. Underwater acoustic monitoring will be conducted to track noise levels associated with any sheet pile installation. Acoustic monitoring will be required wherever instream pile driving activities occur in Atlantic salmon critical habitat. A single hydrophone will be placed at 10 meters upstream and downstream of noise producing

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activity. MaineDOT will continually monitor noise levels to assure activities that may approach the published threshold values for potentially injuring juvenile salmonid will receive noise attenuation measures immediately, assuring the threshold values are not reached. MaineDOT will provide monitoring reports to the USFWS after the completion of each cofferdam installation or immediately after completion of similar activities.

10. All Atlantic salmon mortalities from electrofishing or other related activities will be reported to the USFWS (Thomas Davidowicz at 207/866-3344, Extension 152; Fax 207/866-335 1) within 48 hours of occurrence. Any dead Atlantic salmon will be immediately preserved (refrigerate or freeze) for delivery to the USFWS's office in Orono, Maine. If the USFWS is not available, contact the NMFS in Orono, Maine (Dan Tierney; 207/866-3755) to arrange for delivery. Upon completion of each fish evacuation event, MaineDOT will report the total Atlantic salmon mortality level, if any, for that event. An event is defined as any single attempt to evacuate all fish from a single cofferdam. An event is complete when the cofferdam is dewatered and construction activities may begin.

11. Adverse effects to Atlantic salmon's ability to migrate, forage, shelter, and spawn are not expected as road-stream crossing structures in critical habitat will be designed to span perennial streams using a minimal structure horizontal clearance that is 1.2 times each stream's bankful width.
12. To address potential effects to listed species and critical habitat resulting from fill material acquisition outside the roadway corridor and terminal interchange buffers, MaineDOT will include language in the construction contract, via a Special Provision, which states the contractor will avoid all potential effects to listed species and critical habitat when obtaining fill material needed for construction. The USFWS will receive a copy of the Special Provision for review prior to finalization of the Plans, Specifications and Estimate package. This condition is required because the USFWS's BO and the Incidental Take Statement do not evaluate nor authorize any adverse effects or take associated with fill material acquisition outside the roadway corridor buffer and terminal interchange buffers portion of the action area. If avoidance cannot be achieved, FHWA should reinitiate consultation or the contractor would have to apply for an ESA section 10 permit to acquire an incidental take permit, a

time-consuming process that would likely affect the construction schedule.

13. In accordance with Chapter 500 of the Maine Stormwater Law under the Natural Resources Protection Act, MaineDOT and FHWA, for those sections of the proposed alignment that discharge into streams, MaineDOT will design stormwater management systems that provides the greatest thermal buffering (USFWS, 2014).

3.3 Atmospheric Environment

3.3.1 Air Quality

The study area is in a portion of Penobscot County that is classified by the U. S. Environmental Protection Agency (USEPA) as an Attainment Area for ozone, pursuant to the CAA amendments of 1990 (USEPA, 2008).

Vehicles emit primarily carbon monoxide (CO), hydrocarbons (also known as volatile organic compounds, or VOCs), oxides of nitrogen (NO_x), and, to a much lesser extent, respirable particulate matter (PM₁₀) and (PM_{2.5}), sulfur dioxide (SO₂), and lead (Pb). To determine compliance with the National Ambient Air Quality Standards (NAAQS), the MDEP Bureau of Air Quality Control conducts long-term air-quality monitoring. The MDEP operates several continuous monitoring sites that measure ambient concentrations of criteria pollutants. For a complete

description of air quality, see DEIS Section 3.2.2 Air Quality.

In accordance with FHWA TA6640.8A, Chapter V, Section G.8 (b), the air-quality analysis consists of two components: (1) a qualitative evaluation of the impact of the build alternatives on regional emissions (i.e., a meso-scale assessment); and (2) a qualitative assessment of potential changes in CO concentrations (i.e., a microscale assessment).

3.3.1.1 Mesoscale Assessment

The No-Build Alternative would not worsen air quality in the near future. Over time, air quality would worsen as congestion increases on Routes 1A, 9, and 46.

The build alternatives would result in a reduction in vehicle idling time because the new highway would remove traffic congestion from Routes 1A and 46. The build alternatives would result in emission reductions compared to the No-Build Alternative, thereby providing an air-quality benefit.

3.3.1.2 Microscale Assessment

The potential impacts of the build alternatives on CO concentrations were assessed. The USEPA conformity regulations at 40 CFR 93.116 require that a project neither create or contribute to a new violation of the NAAQS nor worsen existing violations of the NAAQS.

Under the No-Build Alternative, growth in traffic due to normal population growth would result in increased vehicle emissions. The growth in traffic would be offset somewhat by a decrease in motor-vehicle emission factors as older and more polluting vehicles in the nation's fleet are replaced with new vehicles that have lower emission rates.

The build alternatives would introduce traffic into an area where there is comparatively little traffic, causing a slight increase in CO concentrations. However, this would be offset somewhat by an increase in travel speeds with the build alternatives and is not anticipated to lead to violations of the CO standards.

With the build alternatives, traffic would be routed away from Route 1A and traffic idling time would decrease. Therefore, CO concentrations would be reduced from their future No-Build Alternative levels, and violations of the 1-hour and 8-hour CO standards are not anticipated.

3.3.1.3 Mobile Source Air Toxics Analysis

In addition to the criteria air pollutants for which there are NAAQS, the USEPA regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

Mobile source air toxics (MSATs) are a subset of the 188 air toxics defined by the CAA. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned.

Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics result from engine wear or impurities in oil or gasoline.

In March 2001, the USEPA issued the Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources (66 FR 17229, March 29, 2001). This rule was issued under the authority in Section 202 of the CAA. In its rule, the USEPA examined the impacts of existing and newly promulgated mobile source control programs. Based on FHWA projections for 2000 to 2020, these programs would reduce on-highway emissions of four MSATs — benzene, formaldehyde, 1,3-butadiene, and acetaldehyde — by 57 to 65 percent and would reduce on-highway diesel PM emissions by 87 percent. These reductions would occur despite projections that the overall nationwide vehicle miles travelled (VMT) would increase by 64 percent during that timeframe. As a result, the USEPA concluded that no further motor-vehicle emissions standards or fuel standards were necessary to further control MSATs. The USEPA is

preparing another rule under authority of CAA Section 202(l) that would address these issues and could make adjustments to the full 21 and the primary 6 MSATs.

This FEIS includes a basic analysis of the likely MSAT emission impacts of these alternatives because the analysis of MSATs is an emerging science — that is, the available technical tools are not sufficient to predict the study-specific health impacts of the emission changes associated with the build alternatives. Evaluating the environmental and health impacts from MSATs on a proposed highway would involve several key elements: emissions modeling; dispersion modeling to estimate ambient concentrations resulting from the estimated emissions; exposure modeling to estimate human exposure to the estimated concentrations; and the final determination of health impacts based on the estimated exposure. Each step is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this study. Because of the uncertainties, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the study level.

The amount of MSAT emitted would be proportional to the VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for the build alternatives is slightly higher

than the No-Build Alternative because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. The increase in VMT would lead to higher MSAT emissions for the preferred action alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to the USEPA's MOBILE6.2 model (USEPA, 2011b), emissions of all of the priority MSAT except for diesel PM decrease as speed increases. The extent to which these speed-related emission decreases would offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

Because the estimated VMT under each of the alternatives is nearly the same, it is expected that there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions would likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by 72 percent between 1999 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the USEPA projected reductions

is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The build alternatives traffic volume is less than 10,000 vehicles per day and the vehicle speed would increase for the No-Build Alternative. The vehicle mix would not change. Vehicle emissions would decrease for the build alternatives compared to the No-Build Alternative. With an overall decrease in vehicle emissions, the build alternatives would see decrease in MSAT emissions.

3.3.1.4 PM2.5 Hot-Spot Screening Analysis

The analysis consists of answering questions in the process, progressing through Levels 1-3 screening. Each level evaluates study-specific information to determine if the next level of screening is required or if the study qualifies or is disqualified from Hot-Spot Analysis. The study was disqualified from a Hot-Spot Analysis in Level 2 of the screening process because the maximum predicted total traffic volume is fewer than 10,000 vehicles per day. It was determined that the build alternatives would not result in an air-quality impact and that the study meets the CAA's requirements without further PM Hot-Spot Analysis.

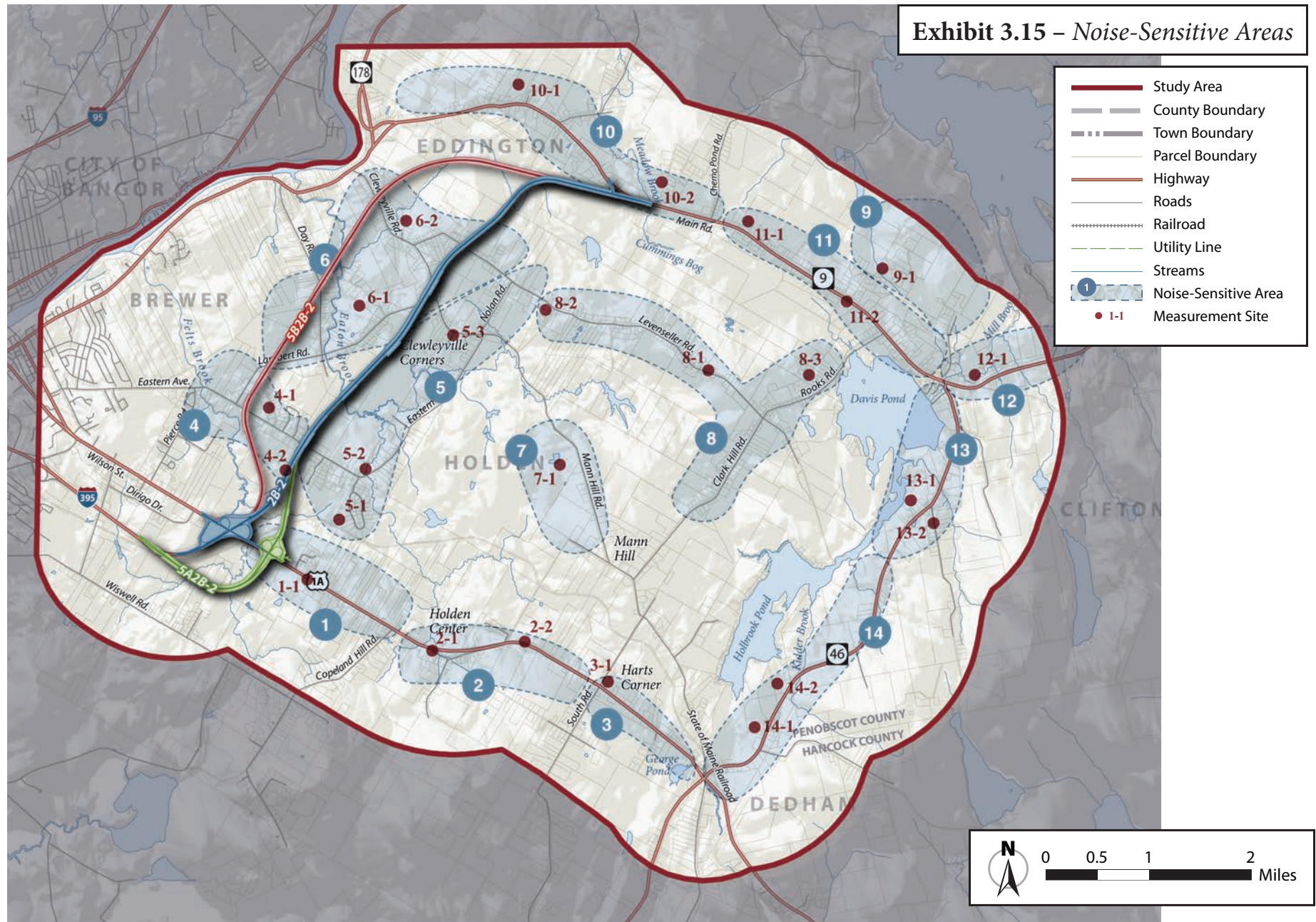
3.3.2 Noise

Fourteen general noise-sensitive areas (NSAs), each encompassing many individual receptors, were identified in the study area (exhibit 3.15).

Noise measurements were conducted to determine ambient (i.e., background) noise levels and to validate the FHWA Traffic Noise Model (TNM) at sites influenced by traffic-generated noise. Measurements were taken in accordance with FHWA Report Number FHWA-PD-96-046, Measurement of Highway Related Noise (FHWA, 1996). Noise levels are A-weighted hourly equivalent noise levels in decibels (Leq (h) dBA). The hourly Leq, or equivalent sound level, is the level of constant sound that in an hour would contain the same acoustic energy as the time-varying sound (i.e., the fluctuating sound levels of traffic noise are represented in terms of a steady-state noise level of the same energy content). A-weighting simulates the response of the human ear to noise. For sites affected by highway traffic, concurrent counts of automobiles and medium-weight trucks, and heavy trucks were recorded and speed observations were made for model validation purposes.

Measured noise levels varied considerably in the study area depending on the proximity of sensitive receptors to major roadways. Overall, short-term measurements ranged from 39 to 71 dBA. Along Routes 1A, 9, and 46, traffic was the major source of ambient

Exhibit 3.15 – Noise-Sensitive Areas



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noise. Noise levels measured at receptors along these roads ranged from 58 to 71 dBA. Along lightly traveled secondary roads, such as Mann Hill Road, Levenseller Road, and Rooks Road, noise levels ranged from 43 to 55 dBA. In the absence of traffic noise from the secondary roads, distant traffic from major roadways could be heard. Background noise levels in remote locations not influenced by highway traffic ranged from 39 to 46 dBA. In these remote locations, noise from distant roadways was occasionally audible.

Noise evaluation of the No-Build Alternative and build alternatives was conducted based on MaineDOT noise policy.

The Noise Abatement Criteria (NAC) for specific land-use activities were used in the evaluation of traffic-noise impacts. These criteria are based on those in Title 23 Code of Federal Regulations, Part 772; U.S. Department of Transportation; the FHWA, Procedures for Abatement of Highway Traffic Noise and Construction Noise, and guidelines for “increase over existing” (IOE) noise levels as set forth in MaineDOT publication “Highway Traffic Noise Policy”. Predicted noise levels were determined using Version 2.5 of the FHWA TNM.

The FHWA and MaineDOT define noise impact based on seven categories of land use. The study area consists of a variety of residential, institutional, commercial, and industrial land uses, the noise analyses considered all Activity Category areas. Individual sites

within a given activity category are designated as noise-sensitive receivers.

The noise-level descriptor is the hourly equivalent sound level (Leq(h)). Leq(h) is the steady-state, A-weighted sound level, which contains the same amount of acoustic energy as the actual time-varying A-weighted sound level over a one-hour period.

Exterior receivers evaluated are categorized as Activity Categories B and C, with an applicable noise level of 66 dBA defining an impact. Noise impact is evaluated by comparing the predicted noise levels with existing noise levels. Where the future (year 2035) noise levels are predicted to equal or exceed 66 dBA or where the No-Build Alternative and the build alternatives are predicted to cause a substantial noise increase (i.e., >15 dBA) in the future as compared to existing noise levels, NAC must be considered.

The noise analyses are based on the conceptual design of the build alternatives. As Alternative 2B-2/the Preferred Alternative is developed, details related to the alignment, profile, cross section, drainage features, right-of-way requirements, and structures are refined, resulting in the final configuration of any noise abatement features determined to be feasible and reasonable.

The model used to predict worst-case existing and future noise levels and to evaluate noise-abatement options was the FHWA’s TNM, Version 2.5. The FHWA TNM predicts noise levels at selected locations based

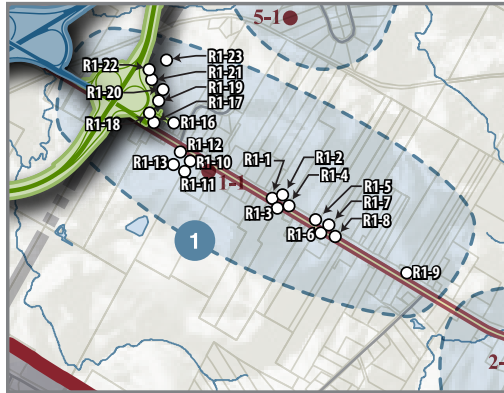
on traffic data, roadway design, topographic features, and the relationship of the analysis site to the roadway.

The noise levels for receivers for the future year were compared to the absolute NAC levels and to increases over existing-year noise levels using MaineDOT's NAC to determine noise impacts (exhibit 3.16). An activity meeting either of these criteria is designated as meeting the warrants for consideration of noise abatement.

Increases in noise for the future No-Build Alternative as compared to existing conditions are the result of normal traffic growth projected to occur between the present and 2035 and range from 0 to 2 dBA.

Compared to existing noise levels, predicted changes in noise levels resulting from the build alternatives result in either an increase or a decrease of sound levels. These changes reflect traffic growth between the

Exhibit 3.16 – Summary of Predicted Noise Levels

	Site	Existing	No-Build		2B-2/the Preferred Alternative		5A2B-2		5B2B-2		
		Leq	Leq	IOE	Leq	IOE	Leq	IOE	Leq	IOE	
Predicted Noise Levels Leq (dBA) NSA 1											
	R1-16	56	58	2			56	0			
	R1-17	65	67	2			62	-3			
	R1-18	61	63	2			60	-1			
	R1-19	53	56	2			56	3			
	R1-20	50	52	2			53	3			
	R1-21	49	51	2			60	11			
	R1-22	48	50	2			62	15			
	R1-23	45	47	2			55	10			

Notes:

Values calculated to tenth of a dBA and then rounded for presentation purposes.

Leq(h) = Hourly equivalent noise level

dBA = Decibels on the A-weighted scale

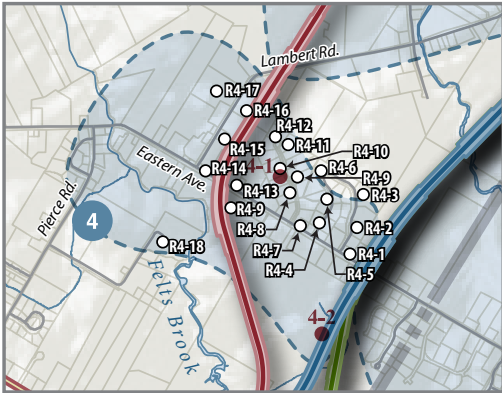
IOE = Increase over existing

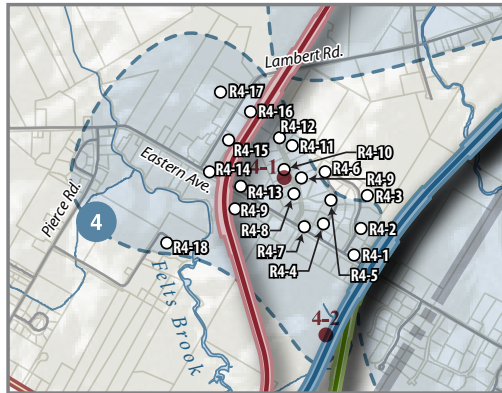
= Impacts based on noise level of 66 dBA or greater; values > 66 dBA shown for existing conditions and No-Build Alternative for informational purposes.

= Impact based on noise level exceeding existing level by 15 dBA or more.

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Exhibit 3.16 – Summary of Predicted Noise Levels (continued)

	Site	Existing	No-Build		2B-2/the Preferred Alternative		5A2B-2		5B2B-2		
		Leq	Leq	IOE	Leq	IOE	Leq	IOE	Leq	IOE	
Predicted Noise Levels Leq (dBA) NSA 4											
	R4-1	42	43	1	57	15	57	15			
	R4-2	37	39	2	55	18	55	18			
	R4-3	34	36	2	51	17	51	17			
	R4-4	38	39	1	48	10	48	10			
	R4-5	36	38	2	46	10	46	10			
	R4-6	35	37	2	44	8	44	8			
	R4-7	46	47	1	49	3	49	3			
	R4-8	35	37	2					48	13	
	R4-9	34	36	2					47	13	
	R4-10	34	36	2					50	16	
	R4-11	34	36	2					51	17	
	R4-12	33	35	2					54	20	
	R4-13	42	43	1					57	15	
	R4-14	47	48	1					58	12	
	R4-15	38	39	2					62	25	
	R4-16	36	38	2					68	32	
	R4-17	34	36	2					56	22	
	R4-18	34	36	2					47	13	
	R4-19	41	42	1					58	17	



Notes:

Values calculated to tenth of a dBA and then rounded for presentation purposes.

Leq(h) = Hourly equivalent noise level

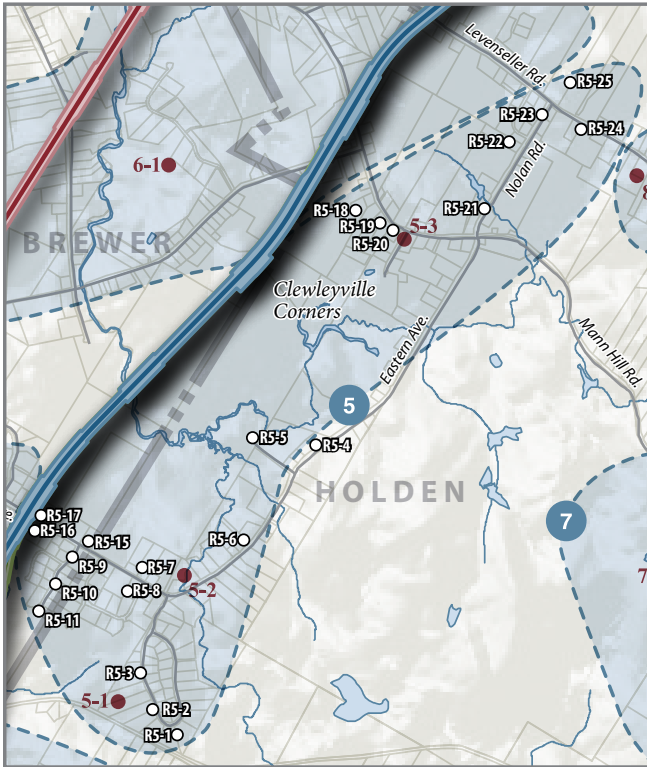
dBA = Decibels on the A-weighted scale

IOE = Increase over existing

= Impacts based on noise level of 66 dBA or greater; values > 66 dBA shown for existing conditions and No-Build Alternative for informational purposes.

= Impact based on noise level exceeding existing level by 15 dBA or more.

Exhibit 3.16 – Summary of Predicted Noise Levels (continued)

	Site	Existing	No-Build		2B-2/the Preferred Alternative		5A2B-2		5B2B-2		
		Leq	Leq	IOE	Leq	IOE	Leq	IOE	Leq	IOE	
Predicted Noise Levels Leq (dBA) NSA 5											
	R5-16	45	46	1	58	14	58	14			
	R5-17	44	45	1	59	16	59	16			


Notes:

Values calculated to tenth of a dBA and then rounded for presentation purposes.

Leq(h) = Hourly equivalent noise level

dBA = Decibels on the A-weighted scale

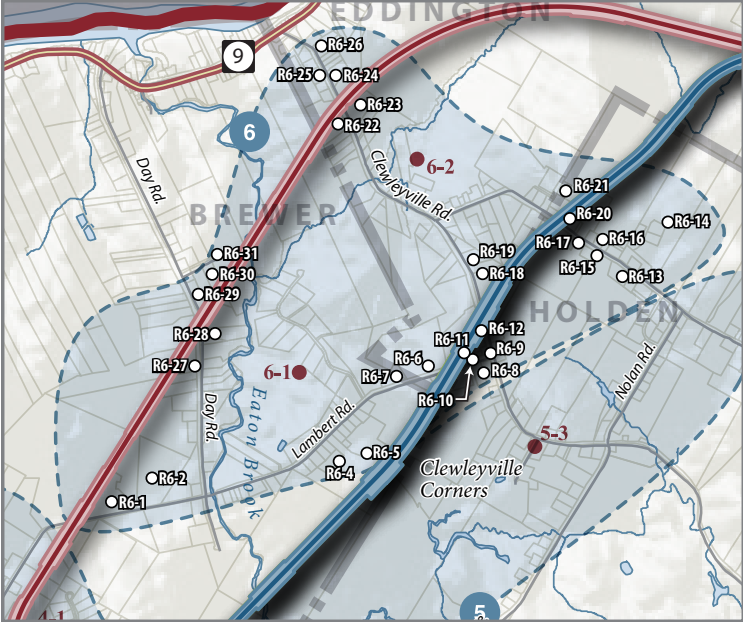
IOE = Increase over existing

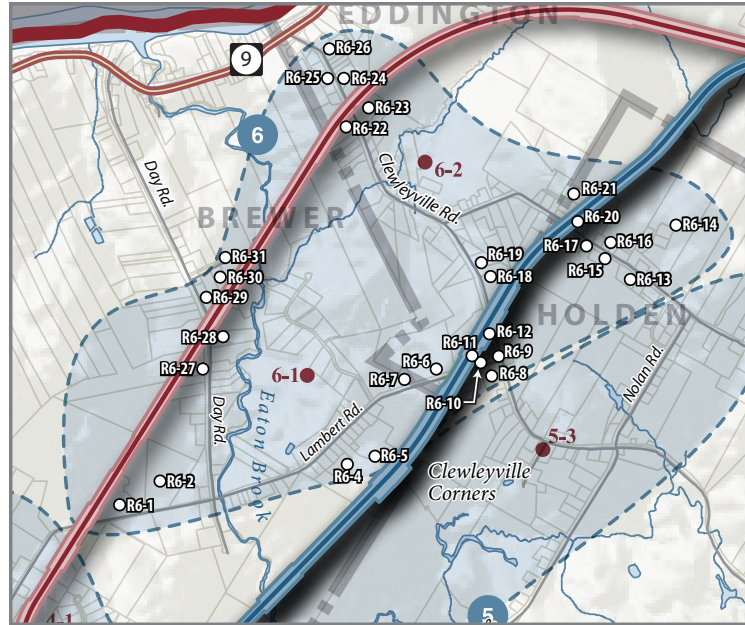
 = Impacts based on noise level of 66 dBA or greater; values > 66 dBA shown for existing conditions and No-Build Alternative for informational purposes.

 = Impact based on noise level exceeding existing level by 15 dBA or more.

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Exhibit 3.16 – Summary of Predicted Noise Levels (continued)

	Site	Existing	No-Build		2B-2/the Preferred Alternative		5A2B-2		5B2B-2		
		Leq	Leq	IOE	Leq	IOE	Leq	IOE	Leq	IOE	
Predicted Noise Levels Leq (dBA) NSA 6											
	R6-1	33	36	2					54	21	
	R6-2	32	34	2					49	17	
	R6-4	33	35	2	53	20	53	20			
	R6-5	32	34	2	58	27	58	27			
	R6-6	35	37	2	58	24	58	24			
	R6-7	35	37	2	51	17	51	17			
	R6-8	39	41	2	54	15	54	15			
	R6-9	45	47	2	56	10	56	10			
	R6-10	42	44	2	58	16	58	16			
	R6-11	34	36	2	66	32	66	32			
	R6-12	43	45	2	61	18	61	18			
	R6-13	41	42	2	45	5	45	5			
	R6-14	33	35	2	45	11	45	11			
	R6-15	45	47	2	50	5	50	5			
	R6-16	41	43	2	50	9	50	9			
	R6-17	48	49	2	53	6	53	6			
	R6-18	38	40	2	60	22	60	22			
	R6-19	41	43	2	55	14	55	14			
	R6-20	42	44	2	61	20	61	20			
	R6-21	34	36	2	64	30	64	30			
	R6-22	39	41	2					59	20	
	R6-23	35	37	2					57	22	
	R6-24	42	43	2					59	18	



Notes:

Values calculated to tenth of a dBA and then rounded for presentation purposes.

Leq(h) = Hourly equivalent noise level

dBA = Decibels on the A-weighted scale

IOE = Increase over existing

■ = Impacts based on noise level of 66 dBA or greater; values > 66 dBA shown for existing conditions and No-Build Alternative for informational purposes.

■ = Impact based on noise level exceeding existing level by 15 dBA or more.

Exhibit 3.16 – Summary of Predicted Noise Levels (continued)

	Site	Existing	No-Build		2B-2/the Preferred Alternative		5A2B-2		5B2B-2	
		Leq	Leq	IOE	Leq	IOE	Leq	IOE	Leq	IOE
	R6-25	44	46	2					56	12
	R6-26	40	42	2					50	10
	R6-27	30	33	2					56	26
	R6-28	30	32	2					55	26
	R6-29	29	32	2					63	34
	R6-30	29	32	2					64	34
	R6-31	29	32	2					60	31

Notes:

Values calculated to tenth of a dBA and then rounded for presentation purposes.

Leq(h) = Hourly equivalent noise level

dBA = Decibels on the A-weighted scale

IOE = Increase over existing

= Impacts based on noise level of 66 dBA or greater; values > 66 dBA shown for existing conditions and No-Build Alternative for informational purposes.

= Impact based on noise level exceeding existing level by 15 dBA or more.

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present and 2035 and the redistribution of traffic with the build alternatives.

Noise from the No-Build Alternative would impact one property in NSA 1. The projected 2035 noise level at the property is 67 dBA; the increase over the existing noise level is 2 dBA.

Noise from Alternative 2B-2/the Preferred Alternative would impact fifteen properties: three properties in NSA 4, one property in NSA 5, and eleven properties in NSA 6. The projected 2035 noise levels at the properties range from 44 to 66 dBA; the increase over existing noise levels is 3 to 32 dBA. Noise from Alternative 5A2B-2 would impact sixteen properties: one property in NSA 1, three properties in NSA 4, one property in NSA 5, and eleven properties in NSA 6. The projected 2035 noise levels at the properties range from 44 to 66 dBA; the increase over existing noise levels is 3 to 32 dBA.

Noise from Alternative 5B2B-2 would impact eighteen properties: eight properties in NSA 4 and ten properties in NSA 6. The projected 2035 noise levels at the properties range from 47 to 68 dBA; the increase over existing noise levels is 10 to 34 dBA. Noise abatement was considered for the impacted properties. In evaluating potential abatement measures, noise walls were modeled using the FHWA TNM and results compared to MaineDOT criteria for feasibility and reasonableness. For a barrier to be feasible under

MaineDOT noise policy, it must provide at least 7 dBA of reduction (i.e., insertion loss). If a barrier is determined to be feasible, it is evaluated for reasonableness. To be reasonable, MaineDOT requires that the barrier cost not exceed \$31,000 per benefited residence, based on a barrier cost of \$31 per square foot. A benefited residence is one that receives an insertion loss of 7 dBA or greater.

Barriers were determined to be feasible for impacted receptors in the NSAs (exhibit 3.17). However, no barrier evaluated was determined to be reasonable because all options considered exceeded the \$31,000 per benefited residence criteria. Sixteen barrier analysis sites were identified along the three build alternatives.

There would be temporary impacts to air quality and noise during construction from the operation of equipment. Proper implementation and maintenance of control measures (e.g., dust/erosion and sedimentation controls, properly fitted emission control devices and mufflers, etc.) would be used to minimize the temporary impacts. During final design, MaineDOT would consider opportunities to specify the use of diesel retrofits, cleaner fuels, and idle reduction measures to minimize emissions from diesel construction equipment. Temporary impacts would cease upon completion of construction.

Exhibit 3.17 – Summary of Noise Abatement Analysis

Alternatives	Barrier Location	Impacted Receptors	Consideration of Abatement Warranted?	Noise Abatement Feasible?	Noise Abatement Reasonable?	Details of Barrier Systems				
						Length (feet)	Average Height (feet)	Cost (\$)	Benefited Residences	Cost per Benefited Residence (\$)
NSA - 1										
5A2B-2	Wilson St./I-395 Interchange	1	Yes	Yes	No	1,148	16.4	584,904	3	194,968
NSA - 4										
5B2B-2	Lambert Road West	3	Yes	Yes	No	2,258	11.7	817,116	3	272,372
5B2B-2	Eastern Avenue	5	Yes	Yes	No	3,197	17.4	1,719,122	2	859,561
2B-2/the Preferred Alternative, 5A2B-2	Eastern Avenue West	3	Yes	Yes	No	2,510	18.3	1,424,546	2	712,273
NSA - 5										
2B-2/the Preferred Alternative, 5A2B-2	Eastern Avenue East	2	Yes	Yes	No	1,389	18.6	799,440	2	399,720
NSA - 6										
5B2B-2	Lambert Road East	2	Yes	Yes	No	3,509	20.0	2,087,448	2	1,043,724
5B2B-2	Day Road East	2	Yes	Yes	No	2,784	19.4	1,671,069	2	835,535
5B2B-2	Day Road West	3	Yes	Yes	No	1,591	17.0	837,378	3	279,126
5B2B-2	Mann Hill Road East	2	Yes	Yes	No	1,981	17.6	1,080,924	2	540,462
5B2B-2	Mann Hill Road West	1	Yes	Yes	No	1,509	17.3	810,124	1	810,124
2B-2/the Preferred Alternative, 5A2B-2	Lambert Road South	2	Yes	Yes	No	2,391	20.0	1,482,490	2	741,245
2B-2/the Preferred Alternative, 5A2B-2	Lambert Road North	2	Yes	Yes	No	2,195	20.0	1,361,029	2	680,515
2B-2/the Preferred Alternative, 5A2B-2	Mann Hill Road East	4	Yes	Yes	No	2,595	19.1	1,533,904	4	383,476
2B-2/the Preferred Alternative, 5A2B-2	Mann Hill Road West	1	Yes	Yes	No	1,535	15.2	721,871	2	360,909
2B-2/the Preferred Alternative, 5A2B-2	Levenseller Road East	1	Yes	Yes	No	1,306	17.3	698,743	1	698,743
2B-2/the Preferred Alternative, 5A2B-2	Levenseller Road West	1	Yes	Yes	No	1,479	15.1	690,505	1	690,505

Note: The total cost to mitigate noise for each build alternative is: Alternative 2B-2 - \$8,712,528; Alternative 5A2B-2 - \$9,297,432; Alternative 5B2B-2 - \$9,023,181.

MaineDOT conducted a review of 2012 vehicle classification data to determine what, if any, impact the recent change in Maine Interstate highway weight limits has had on traffic volumes on Route 9, Route 46, and other selected highways. In November of 2011, the allowable gross vehicle weight of Class 10 vehicles (tractor-trailers with six axles) increased from 80,000 pounds to 100,000 pounds. This change is likely to increase the amount Class 10 traffic on Interstate highways, increase Class 10 traffic on highways that connect to the Interstate, and reduce Class 10 traffic on highways that parallel the Interstate.

In 2012, MaineDOT conducted an extensive short-term vehicle classification counting program in central, eastern, and northern Maine to provide new information on Class 10 travel patterns. These class counts, along with data from permanent classification sites, were compared to 2011 class data to identify corridors where changes in Class 10 volumes and travel patterns have appeared.

To address the question of the law's impact on the study area, 2012 data from selected vehicle class sites was reviewed and compared to class data collected at those same sites in 2011 and 2009.

The principal finding of the data review is that there does not appear to be a substantial shift in long distance Class 10 truck traffic from Route 9 in eastern Maine to I-95 in northern Maine. The best sources of Class 10 volume data come from the permanent long-term classification sites, where vehicular traffic is counted and classified year-round. The permanent vehicle classification station on Route 9 in T22MD has shown slightly fewer daily Class 10 trucks in 2012 than in 2011. Meanwhile, the permanent vehicle classification station on I-95 in Medway has shown an increase in the daily Class 10 volume of more than 100 in the southbound (loaded) direction. Further review of short-term classification data in Lincoln and Mattawamkeag shows that the change on I-95 can be attributed almost entirely to Class 10 traffic diverted from parallel U.S. Route 2, where 100,000 pound Class 10 vehicles have been allowed for many years. Other short-term classification counts on Route 9 and Route 46 show mixed results, indicating a small shift, if any. The conclusion is that the Interstate gross vehicle weight increase to 100,000 pounds has resulted in a shift in shorter-length Class 10 trips on parallel routes such as U.S. Route 2, but has not resulted in significant shift in the longer-length Class 10 trips on Route 9.

3.4 Transportation Environment

3.4.1 Transportation Facilities and Systems

The major roads in the study area are I-395, Route 1A, Route 46, and Route 9. I-395, Route 1A, and Route 9 are designated as part of the NHS. Other important local roads in the study area are Eastern Avenue, Mann Hill Road, Levenseller Road, Lambert Road, and Clark Hill Road. These roadways are two-lane rural roads, without shoulders, that provide local connections between residential areas and major roads.

The intersection of Routes 1A and 46 is a signalized intersection. To the east and west of the intersection, Route 1A has a left turn lane and a through lane. The northbound and southbound lanes of the Route 46 intersection only have one lane for all traffic movements.

The intersection of Routes 46 and 9 is an unsignalized "T" intersection with a stop sign controlling traffic on Route 46. The Route 46 northbound side of the intersection has one lane, from which vehicles can turn left or right. Route 9, westbound and eastbound, has one through lane in each direction.

For a complete description of transportation facilities and systems, see the DEIS Section 3.3.1 Transportation Facilities and Systems.

The No-Build Alternative would not impact the transportation facilities and systems in the study area and region. However, during routine maintenance,

the No-Build Alternative would temporarily impact transportation facilities.

The build alternatives would impact the transportation facilities in the study area by improving consistency in operating speeds and reducing travel time. Alternative 2B-2/the Preferred Alternative and Alternative 5B2B-2 would partially reconstruct the existing I-395 interchange with Route 1A (exhibit 2.5); the extent of reconstruction would be determined during final design of Alternative 2B-2/the Preferred Alternative. Alternative 5A2B-2 would require the realignment of approximately 1.5 miles of I-395 to the east of the existing location, the construction of a new interchange between I-395 and Route 1A, and the removal of the easternmost portion of I-395 and the existing interchange with Route 1A (exhibit 2.8). The build alternatives would either bridge over or pass underneath the roads it crosses (exhibits 2.4, 2.7, and 2.9).

The build alternatives would connect to Route 9 at a “T” intersection (exhibit 2.6). Route 9 eastbound would be controlled with a stop sign.

The build alternatives would create an opportunity to redesignate a portion of the NHS in the study area from Water Street in Bangor to the preferred alternative.

The No-Build Alternative would not impact pedestrians and bicyclists.

Bicyclists and pedestrians would be allowed to use the build alternatives. The build alternatives would function as an extension of the existing Route 9, or

like any other one lane non Interstate controlled access facility in the state. An example where bicyclists and pedestrians are allowed is Route 196 in Topsham. The only locations that the State of Maine prohibits bicyclists or pedestrians without a positive separation between the traffic and the pedestrians are facilities with two lanes or more in each direction that function like interstate facilities. It should be noted that some states allow bicyclists on the interstate system (two lanes or more in each direction) without positive separation. Maine does not allow that. Bicyclists would have access to the build alternatives without needing to use the interstate system. The state may consider closing the facility to pedestrians because of the long distance without any outlets.

MaineDOT would work with town officials and evaluate Route 9 for potential improvements to improve safety for pedestrians and bicyclists along Route 9. Providing safe access for pedestrians and bicyclists along the road system typically consists of paved shoulders, sidewalks in highly developed areas, high visibility crossings where warranted, and signage to help alert drivers of the presence of bicyclists and pedestrians on the road system. A road safety audit would be conducted in conjunction with town officials and residents to develop potential immediate and longer term improvements that the town can consider as options to improve safety for pedestrians and bicyclists.

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The build alternatives would not impact the bus, air, and rail transportation systems in the study area and region.

3.4.2 System Continuity and Mobility

Poor system continuity was identified as one of the needs for highway improvements in the study area (section 1.3.1). The transitions in travel speed, roadway geometry, and capacity for motorists traveling between I-395 and Route 9 are inconsistent and contribute to safety concerns, delays in passenger and freight movement, and conflicts between local traffic and regional traffic.

Severe traffic congestion exists on Route 1A and it becomes more noticeable in the approach to I-395. Traffic congestion is most pronounced in the summer months. Motorists can experience considerable delays when attempting to turn left across traffic and onto Route 1A, and many serious crashes have occurred on Route 1A.

The No-Build Alternative would not improve system continuity. Traffic would continue to use existing roads – primarily Route 1A and Route 46 – to travel between I-395 and Route 9. Over time, with increasing traffic congestion, system continuity on existing routes would worsen. The transitions in travel speed, roadway geometry, and capacity would increasingly become more inconsistent for travelers with growth in overall traffic volume and changes in traffic composition with increased truck traffic. Improvement

of the intersection of Routes 9 and 46 would improve operational capacity (additional through-lanes and dedicated turn lanes) of the intersection but would not substantially improve overall system continuity or mobility for regional travelers.

The build alternatives would improve system continuity for regional travel between I-395 and Route 9 by providing a new controlled-access highway with improved continuity in speeds and roadway geometry. The proposed highway would carry a similar lane configuration throughout the entire length and would be posted at 55 mph. The proposed highway would bypass portions of Routes 1A and 46 in the study area that lack continuity. Delays at the signalized intersection of Routes 1A and 46 would be less than 80 seconds for all movements, with the exception of left turns from westbound Route 1A to southbound Route 46, due to reductions in through-traffic along Route 1A. At the intersection of Routes 9 and 46, delay for vehicles from Route 46 northbound to Route 9 in 2035 would decrease to approximately 21.5 seconds.

3.4.3 Existing and Projected Demand

Future traffic volumes for study-area roadways were forecasted to 2035, which was chosen because it represents the future design year for which alternatives are being evaluated. With the 2008 economic downturn and increase in the price of gas, traffic in the study area has not

grown as fast as previously forecast. In December 2009, MaineDOT reexamined the system linkage need and Route 9 in greater detail to determine whether it could reasonably accommodate the future traffic volumes foreseeable within the next 20 years. MaineDOT believes the growth in traffic and traffic volumes originally forecast for Route 9 and the rest of the study area for the year 2030 would not materialize until the year 2035 and Route 9 has adequate capacity and would continue to operate at an acceptable level of service and operating speed up to and beyond the year 2035 (the time period that has been determined to be reasonably foreseeable). The 2035 traffic-volume projections were derived based on a review of traffic forecasts from the statewide travel-demand model and historical traffic-volume increases.

Future 2035 AADT volumes compared with 1998, 2006, and 2010 AADT (exhibit 1.3) depict travel demand growth trends in the study area. Volumes are shown for eight roadway segments that form important links in the area transportation network. The three major roadway segments currently used by drivers from I-395 to Route 9 north of the study area (i.e., Route 1A west of Route 46, Route 46 north of Route 1A, and Route 9 east of Route 46) are projected to have the largest percentage increases in AADT in the local transportation network between 2010 and 2035. These same roadway segments would experience substantial growth in the heavy-truck component of the AADT by 2035.

Estimates of roadway performance were developed using the applicable DHV, v/c ratio, and LOS for five major roadway segments within the study area (exhibit 1.5). Traffic volumes along Route 1A are forecasted to exceed roadway capacity by 2035 under the No-Build Alternative condition, with an accompanying LOS of F and reduction in average travel speed. Route 46 performance would fall to LOS D with a marked reduction in average travel speed, and conditions along Route 9 would decrease to LOS E.

The No-Build Alternative would not improve regional mobility, traffic congestion, or safety in the study area. Over time, with increasing traffic volumes, roadway performance would continue to decline in terms of LOS and travel speeds. Increases in heavy truck traffic, especially along Route 46 between Routes 1A and 9, would further exacerbate capacity and safety issues.

With the build alternatives, roadway-system performance would improve in comparison to the No-Build Alternative (exhibit 3.18). In 2035, the new two-lane highway would carry approximately 20 percent (i.e., 7,745 AADT) of the total traffic through the study area and a majority of the traffic destined between I-395 and Route 9, thereby reducing traffic volumes and increasing mobility and safety on Routes 1A and 46. The study area would experience reductions of regional-through heavy-truck traffic on Routes 1A and 46 because those trips would use the proposed highway, whereas

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Exhibit 3.18 – Changes in Traffic Volumes

Location	No-Build Alternative		Build Alternatives		Change in 2035 AADT No-Build v. Build	% Change in 2035 AADT No-Build v. Build
	2010	2035	2010	2035		
Total AADT	2010	2035	2010	2035		
Route 1A east of I-395	22,236	33,070	20,754	26,410	-6,660	-20.1
Route 1A west of Route 46	16,976	30,600	15,494	23,940	-6,660	-21.8
Route 1A east of Route 46	12,116	18,870	12,116	18,870	0	0.0
Route 46 south of Route 1A	2,021	3,130	2,021	3,130	0	0.0
Route 46 north of Route 1A	3,058	8,570	1,576	1,910	-6,660	-77.7
Route 9 east of Route 178	7,156	8,730	6,071	7,645	-1,085	-12.4
Route 9 west of Route 46	5,129	5,410	6,611	12,070	6,660	123.1
Route 9 east of Route 46	5,830	10,940	5,830	10,940	0	0.0
Truck AADT	1998	2035	2035			
Route 1A east of I-395	1,569	2,449	1,439		-1,010	-41.2
Route 1A west of Route 46	1,569	2,449	1,439		-1,010	-41.2
Route 1A east of Route 46	1,569	2,449	1,439		-1,010	-41.2
Route 46 south of Route 1A	265	281	281		0	0.0
Route 46 north of Route 1A	604	1,167	157		-1,010	-86.5
Route 9 east of Route 178	569	662	447		-215	-32.5
Route 9 west of Route 46	604	1,167	2,177		1,010	86.5
Route 9 east of Route 46	879	1,535	1,535		0	0.0

heavy-truck traffic along Route 9 west of Route 46 would increase over the No-Build Alternative. The build alternatives, including those that use portions of Route 9, would improve the quality of traffic flow at the intersection of Route 9/46 and other physically less intrusive improvements (e.g., adding turn lanes) could be made to the intersection that would further improve the quality of traffic flow at the intersection.

Improvements in LOS, or no further decrease in LOS, would occur on each of the key roadway segments in the study area with implementation of a build alternative (exhibit 3.19).

3.4.4 Crash Reductions

Locations in the study area exhibit higher crash rates than other locations in Maine with similar roadway and traffic characteristics. Of the major roads in

Exhibit 3.19 – Changes in DHV, v/c Ratio, Travel Speed, and LOS

<i>Year</i>	<i>DHV</i>	<i>v/c Ratio</i>	<i>Average Travel Speed (mph)</i>	<i>LOS Rural Two-Lane Road</i>
Route 1A east of I-395				
2035 No Build	3,269	1.12	varies	F
2035 Build	2,612	0.9	28	E
Route 1A east of Route 46				
2035 No Build	2,123	0.72	37.5	E
2035 Build	2,123	0.72	37.5	E
Route 46 between Route 1A and Route 9				
2035 No Build	1,006	0.4	40.8	D
2035 Build	346	0.15	45	C
Route 9 east of Route 178				
2035 No Build	873	0.36	39.5	E
2035 Build	764	0.32	40.3	D
Route 9 east of Route 46				
2035 No Build	1,267	0.46	39.3	E
2035 Build	1,267	0.46	39.3	E

the study area, the section of Route 1A between Parkway South and I-395 and the intersection of Route 9 (known locally as North Main Street) and Riverside Drive are the sites of six HCLs (exhibit 1.2).

To evaluate the potential improvement in safety, the No-Build Alternative and the build alternatives were evaluated using the FHWA Interactive Highway Safety Design Model (IHSDM) (FHWA, 2010). IHSDM is a suite of software analysis tools for evaluating the safety and operational effects of highway design. The model

is intended to predict the functionality of proposed or existing roadway designs by applying chosen design guidelines and generalized data to predict performance of the design. Although based on engineering design and roadway-environment conditions, estimates from IHSDM are expected values from a statistical sense (i.e., they represent the estimated average performance among a large number of sites with similar characteristics). Actual performance or experiences associated with the roadway may vary over time; therefore, IHSDM estimates are intended to be only one of many inputs into the decision-making process (FHWA, 2003).

Estimates of crashes for the No-Build Alternative and the build alternatives were developed using engineering alignments and the Crash Prediction Module of the IHSDM model. Crash types estimated were Fatal/ Serious Injury, Injury, and Property Damage Only (PDO). The Fatal/Serious Injury crashes generally involve a fatality, disabling injury, or long-term incapacitation. An Injury crash typically involves an injury with a short- to medium-term recovery period. PDO crashes involve no injuries and typically involve only damage to vehicles or other property.

The build alternatives have a lower crash potential than the No-Build Alternative. Alternative 2B-2/the Preferred Alternative would have the lowest number of potential crashes across all three crash types. The major factor providing an advantage to the build

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alternatives concerning potential crash events is the crossroads and driveway-access points, fewer vehicle conflict points exist with the build alternatives in comparison to the No-Build Alternative. The improved horizontal and vertical grades (i.e., fewer sharp turns and hills than the No-Build Alternative) of the build alternatives contribute to reduced crash potential.

To estimate the potential costs associated with the range and number of predicted crashes, mean cost data were derived as composite results from the FHWA's Crash Cost Estimates by Maximum Police- Reported Injury Severity within Selected Crash Geometries (FHWA, 2005) using undefined crash-geometry estimates. Mean-cost data used were comprehensive estimates, including costs for medical treatment, emergency services, property damage, lost productivity, and adverse effects on quality of life. The crash costs were adjusted to 2011 value using the Consumer Price Index (CPI) for capital-cost

components (i.e., medical treatment, emergency services, property damage, and lost productivity) and the Employment Cost Index for quality-of-life effects.

With Alternative 2B-2/the Preferred Alternative, modeled crash costs would provide an approximate 28 percent savings in comparison to the No-Build Alternative. Cost savings of 20 to 22 percent would be realized with Alternatives 5A2B-2 and 5B2B-2 over the No-Build Alternative (exhibit 3.20).

3.4.5 Mobility Benefits, including Economic Benefits

To illustrate the mobility benefits of implementation of a build alternative, VHT and VMT changes were monetized and compared to the No-Build Alternative. VHT and VMT were derived from the shift of traffic from Route 1A and Route 46 to the build alternatives and Route 9.

Exhibit 3.20 – Crash Estimates and 2035 Annual Costs

<i>Alternative</i>	<i>Number of fatal/serious injury crashes</i>	<i>Cost for fatal/serious injury crash (\$3,493,128 per)</i>	<i>Number of injury crashes</i>	<i>Cost for injury crash (\$83,546 per)</i>	<i>Number of PDO crashes</i>	<i>Cost for PDO crash (\$9,410 per)</i>	<i>Total Crash Costs</i>	<i>Crash Cost Savings over No-Build</i>
No-Build	5.14	\$17,954,678	9.38	\$783,661	19.85	\$186,789	\$18,925,128	0
2B-2/the Preferred Alternative	3.75	\$13,099,230	6.85	\$572,290	14.50	\$136,445	\$13,807,965	\$5,117,163
5A2B-2	4.14	\$14,461,550	7.56	\$631,608	16.00	\$150,560	\$15,243,718	\$3,681,410
5B2B-2	4.02	\$14,042,375	7.33	\$612,392	15.52	\$146,043	\$14,800,810	\$4,124,318

Note: Crash output obtained using: Interactive Highway Safety Design Model (IHSDM), FHWA, 2010 Release.

Crash cost estimates derived from: Crash Cost Estimates by Maximum Police-Reported Injury Severity Within Selected Crash Geometries.

FHWA October 2005. Publication No. FHWA HRT-05-051

Monetized benefits for VMT were calculated using only typical variable vehicle-operating costs (i.e., fuel and oil, repair and maintenance, and tires) for passenger vehicles and freight trucks. For passenger vehicles, the average variable operating cost per mile of \$0.1774 (a composite value considering costs of small, medium, and large size automobiles) was based on American Automobile Association (AAA) data for 2011. Freight-truck per-mile variable costs of \$0.65 were developed using 2010 data from the American Transportation Research Institute (ATRI).

Net present-value cost savings for passenger-vehicle drivers and freight-truck drivers would be approximately six percent with Alternative 2B-2/the Preferred

Alternative, whereas drivers with Alternatives 5A2B-2 and 5B2B-2 would spend an additional four percent to seven percent, in comparison to the No-Build Alternative, to travel between I-395 and Route 9. The differences in costs are directly attributable to the length of the build alternatives (exhibit 3.21).

Monetized benefits for vehicle hours travelled (VHT) were calculated using variable vehicle-operating costs, fixed vehicle operating costs (i.e., vehicle financing, insurance, taxes, license and registration, and depreciation), and operator-based costs (i.e., value of personal time, considering wages, benefits, and trip purpose).

Exhibit 3.21 – Changes in VMT and Vehicle Operating Costs

<i>Alternative</i>	<i>AADT</i>	<i>Length (miles)</i>	<i>Vehicle Miles Traveled</i>	<i>Vehicle Operating Costs per Mile</i>	<i>Vehicle Operating Costs</i>	<i>Operating Cost Savings over No-Build</i>
Passenger Vehicle¹						
No-Build	6,520	10.2	23,582,579	0.1774	\$4,183,550	\$0
2B-2/the Preferred Alternative	6,520	6.1	22,189,907	0.1774	\$3,936,490	\$247,060
5A2B-2	6,520	7.3	25,114,518	0.1774	\$4,455,316	-\$271,766
5B2B-2	6,520	7.0	24,394,971	0.1774	\$4,327,668	-\$144,118
Freight Truck²						
No-Build	1,225	10.2	4,430,776	0.65	\$2,880,004	\$0
2B-2/the Preferred Alternative	1,225	6.1	4,169,116	0.65	\$2,709,925	\$170,079
5A2B-2	1,225	7.3	4,718,602	0.65	\$3,067,091	-\$187,087
5B2B-2	1,225	7.0	4,583,411	0.65	\$2,979,217	-\$99,213

Notes:

¹ Passenger vehicle-operating costs derived from “Behind the Numbers—Your Driving Costs, 2011 Edition”. American Automobile Association (AAA).

² Freight-truck operating costs derived from: “An Analysis of the Operational Costs of Trucking: 2011 Update”. American Transportation Research Institute.

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Using U.S. Department of Transportation guidance on the Valuation of Travel Time in Economic Analysis (USDOT, 2003), values of operator-based costs for passenger vehicles were adjusted to 2011 dollars and estimated to be \$20.45 an hour for each “all-purpose” automobile (i.e., a weighted average of business automobile and passenger automobile travelers). Total vehicle operating costs (variable and fixed) were estimated to be \$1.00 per hour based on AAA data,

resulting in a total VHT value of \$21.45 for passenger vehicles.

The value of travel time for freight trucks was based on adjusted 2010 average marginal-cost data for truck operations from the ATRI, resulting in a total VHT value of \$59.61 per hour for heavy trucks.

Using VHT as a comparative criterion that considers both the alternative length and travel speed, each build alternative would provide cost savings over the

No-Build Alternative. VHT savings with the build alternatives for both passenger and freight trucks range from six percent to 16 percent. VHT and monetized savings are highest with Alternative 2B-2/ the Preferred Alternative, whereas savings with Alternative 5A2B-2 are approximately 11 percent less and with Alternative 5B2B-2 are approximately 40 percent less (exhibit 3.22).

Exhibit 3.22 – Changes in VHT and Vehicle Operating Costs

Alternative	AADT	Length (miles)	Miles Traveled	Vehicle Hours Traveled	Travel Time Savings over No-Build (Hours Traveled)	Vehicle Total Costs per Hour	Total Vehicle Travel Time Cost Savings over No-Build
Passenger Vehicle¹							
No-Build	6,520	10.2	23,582,579	524,058	0		
2B-2/the Preferred Alternative	6,520	6.1	22,189,907	438,246	85,812	\$21.45	\$1,840,667
5A2B-2	6,520	7.3	25,114,518	491,421	32,637	\$21.45	\$700,064
5B2B-2	6,520	7.0	24,394,971	478,338	45,720	\$21.45	\$980,694
Freight Truck²							
No-Build	1,225	10.2	4,430,776	98,462	0		
2B-2/the Preferred Alternative	1,225	6.1	4,169,116	82,339	16,123	\$59.61	\$961,092
5A2B-2	1,225	7.3	4,718,602	92,330	6,132	\$59.61	\$365,529
5B2B-2	1,225	7.0	4,583,411	89,872	8,590	\$59.61	\$512,050

Notes:

¹ Passenger-vehicle operating costs derived from “Behind the Numbers—Your Driving Costs, 2011 Edition”, American Automobile Association, and FHWA “Revised Guidance on the Valuation of Travel Time in Economic Analysis”, February 11, 2003.

² Freight-truck operating costs derived from “An Analysis of the Operational Costs of Trucking: 2011 Update”. American Transportation Research Institute.

3.5 Land Use and Cultural, Social, and Economic Environments

3.5.1 Land Use

3.5.1.1 Land Use and Land Cover

Land use was identified using the USGS “A Land Use and Land Cover Classification System for Use with Remote Sensor Data” (USGS, 1983). Forest land is the dominant land use in the study area, encompassing approximately 66 percent of the area. The second-most dominant land use is shrub, which encompasses approximately 10 percent of the study area. Because these two land uses dominate, most of the study area is sparsely developed. Approximately nine percent of the study area is residential and one percent is commercial. Most commercial development is located along Route 1A in Brewer. For a complete description of land use, see the DEIS Section 3.4.1.1 Land Use and Land Cover.

The No-Build Alternative would result in minimal adverse impacts to land use. Over time, traffic volumes along Routes 1A, 9, and 46 through the study area would increase, resulting in longer delays and congestion. As traffic volumes increase, more local traffic would divert to local roads seeking alternate routes to bypass traffic congestion in and approaching the study area. Increasing traffic volumes on local roads would lead to increased congestion and longer delays for motorists traveling on them, as well as a general

decrease in the local quality of life. The increased congestion and longer delays would further exacerbate existing conditions that make it difficult for businesses to thrive and residents to travel unimpeded.

During public-involvement activities, residents in the study area favored keeping the build alternatives as separated from residential areas as possible. They strongly indicated that they placed a higher value on maintaining quiet residential areas than on preserving open space, which they felt was more important in comparison. In general, residents felt that the social environment should be valued more highly than the natural environment.

The build alternatives would impact land use through the acquisition of property and the conversion of land uses to transportation use. The conversion of land use would range from approximately 163 to 215 acres (exhibit 3.23).

For people living and working in proximity to the build alternatives, their view of the landscape in the area would change. The scenic view of some areas would be altered by the build alternatives and the loss of aesthetic resources such as vegetation, forestland, farmland, pastures, and/or streams.

The build alternatives would introduce additional lighting along highways and at the proposed interchanges and possibly lighting at the intersection. The build alternatives would introduce new lighting, to areas with little or no lighting, from headlights.

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Exhibit 3.23 – Impacts to Land Use (acres)

	No-Build	2B-2/ the Preferred Alternative	5A2B-2	5B2B-2
Residential		7	12	11
Commercial		3	4	3
Agricultural		21	23	29
Transportation, Communications, Utilities		5	7	7
Mowed Grass		5	6	6
Shrub		21	42	28
Dense Shrub		1	2	6
Deciduous Forest		89	98	93
Coniferous Forest		1	1	0
Mixed Forest		9	20	2
Surface Water		1	0 ¹	1
Total		163	215	186

Note: ¹ Impact less than a half-acre.

Lighting at the interchanges and intersection would allow motorists to safely enter and exit the build alternatives. Lighting from vehicles using the build alternatives would affect homes and businesses that are located close to them. Typically, low beam and high beam headlights shine no more than 350 and 450 feet ahead, respectively (Naval Safety Center, 2004).

3.5.1.2 Relocations

The process for property acquisition is explained in the State of Maine, Department of Transportation, A Land Owner's Guide to the Acquisition Process (MaineDOT, 2002). When it is determined that a

property or portion of a property is to be acquired, a market assessment is performed. The acquisition and relocation program would be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Relocation resources are available to all residential and business relocatees without discrimination. MaineDOT would provide just compensation in accordance with the Uniform Relocation Act for the property to be acquired. If landowners believe that the offer for their property is unfair, an appeals process exists to resolve the differences about the value. The Uniform Relocation Act protects landowners from unfair and inequitable acquisition of property.

The build alternatives would displace 6 to 16 residences. Alternative 5A2B-2 would displace the Brewer Fence Company, Eden Pure Heaters, Mitchell's Landscaping & Garden Center, and Town 'N Country Apartments. Alternative 5B2B-2 would displace the Bangor Hydro-Electric Company building and a compressor station (exhibit 3.24).

For Alternative 2B-2/the Preferred Alternative, the properties of those potentially displaced residents range from approximately 0.50 acre to 20.19 acres, with the majority between 2.0 and 4.0 acres. The assessed value of those potentially displaced properties and residences range from approximately \$50,000 to \$340,000, with the majority between approximately \$147,000 and \$323,000.

For Alternative 5A2B-2, the properties of those potentially displaced residents range from approximately 0.50 acre to 20.19 acres, with the majority between 2.0 and 4.0 acres. The assessed value of those potentially displaced properties and residences range from approximately \$50,000 to \$340,000, with the majority between approximately \$147,000 and \$323,000.

For Alternative 5B2B-2, the properties of those potentially displaced residents range from approximately 0.50 acre to 20.19 acres, with the majority between 2.0 and 4.0 acres. The assessed value of those potentially displaced properties and residences range from approximately \$50,000 to \$340,000, with the majority between approximately \$124,000 and \$242,500.

MaineDOT performed an assessment for comparable replacement housing for those potentially displaced residents in January 2014 and concluded sufficient replacement housing exists in the area. In January 2014, there were approximately 150 homes of comparable size and price range for sale in the City of Brewer and the Towns of Holden and Eddington. When the Towns of Clifton and Dedham are also considered, there were approximately 240 homes of comparable size and price range for sale.

Based on the value of properties to be acquired and the number of homes of similar price and functionality available in the study area and region, it appears that finding a suitable replacement property that

Exhibit 3.24 – Displacements

	<i>Residences</i>	<i>Businesses</i>	<i>Business Impacts</i>
No-Build			
2B-2/ the Preferred Alternative	8	None	-
5A2B-2	16	Brewer Fence Company, Eden Pure Heaters, Mitchell's Landscaping & Garden Center, and Town 'N Country Apartments	
5B2B-2	6	Bangor Hydro-Electric Co. Building, and Maritimes and Northeast Pipeline LLC c/o Duke Energy Compressor Station	-

meets characteristics, needs, income, preferences, and other factors pertinent for successful relocation of the affected households would be achievable. However, based on their experience with other projects, MaineDOT acknowledges that locating suitable (safe, decent, and sanitary) replacement housing within the financial capability of affected property owners may not be possible in all cases and providing last resort housing may be required. Last resort housing is a procedure in which MaineDOT (under the Federal Relocation Assistance Program) provides financial assistance to a displaced person when comparable decent, safe, and sanitary housing is not available that is within the financial means of the displaced person.

Further, as the Proposed Action is anticipated to be constructed in phases due to financial constraints, the demand for available housing and commercial property stock in the study area and region would be spread

out over a period of years. The acquisition and relocation program would be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Relocation resources are available to all residential relocates without discrimination.

Following the availability of the FEIS, MaineDOT would coordinate with those potentially displaced residents to determine special relocation considerations and any measures required to resolve relocation concerns.

The No-Build Alternative would not impact local tax revenues.

The build alternatives would result in a reduction in tax revenue in Brewer, Holden, and Eddington because the land converted to transportation use would no longer be tax-eligible. Annual tax revenue would decrease by approximately:

Alternative 2B-2/the Preferred Alternative

- Brewer: \$37,000
- Holden: \$7,200
- Eddington: \$20,200

Alternative 5A2B-2

- Brewer: \$42,700
- Holden: \$19,100
- Eddington: \$19,400

Alternative 5B2B-2

- Brewer: \$159,200
- Holden: \$0
- Eddington: \$9,400
-

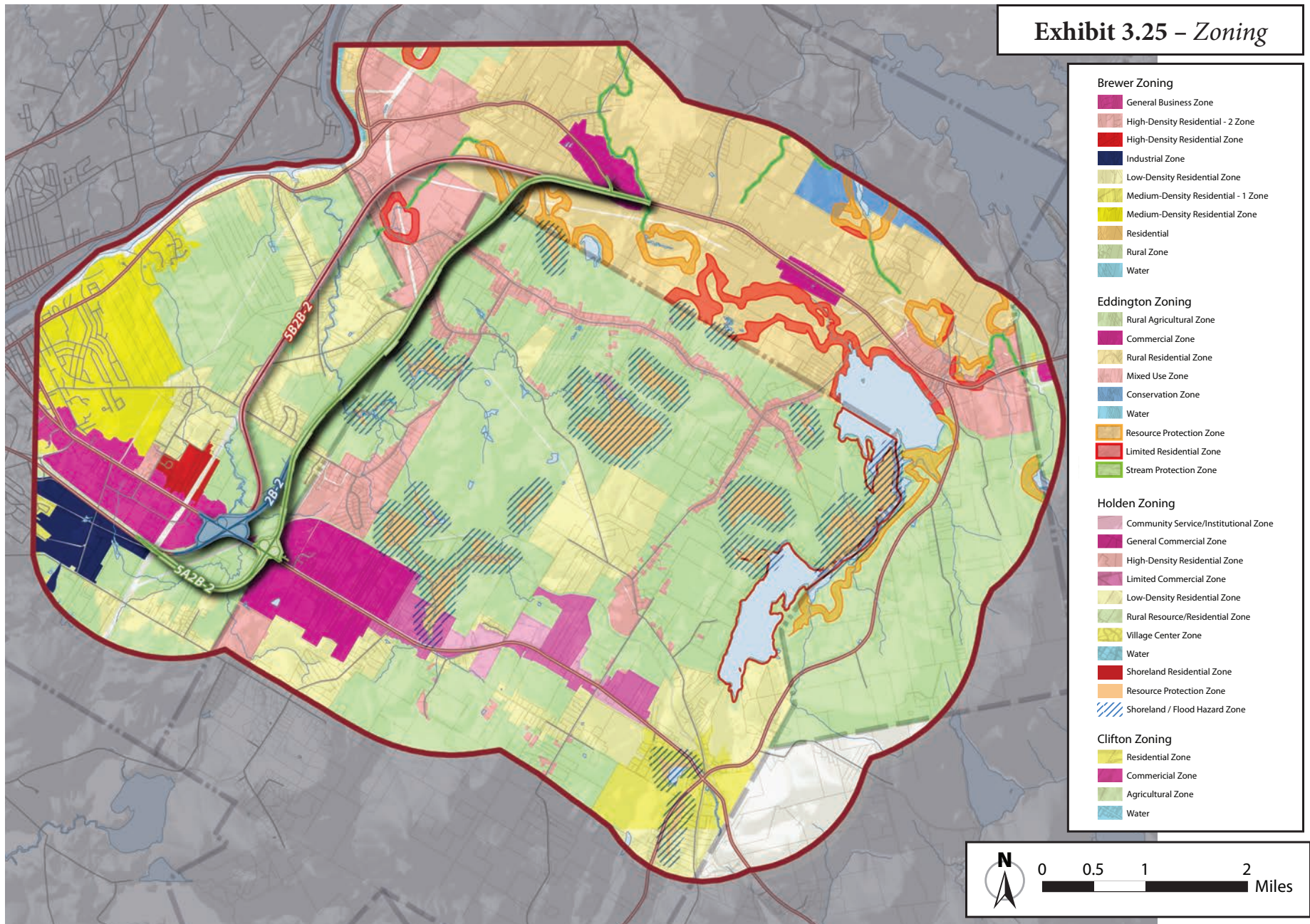
The decreases in revenue represent less than two percent of total tax revenues in each municipality.

3.5.1.3 Future Land Use and Zoning

The comprehensive plans for Brewer, Holden, and Eddington promote the expansion of commercial and residential uses in or near areas of existing development, development of supporting transportation networks, and the protection of open spaces. For a complete discussion on future land use and zoning, see DEIS Section 3.4.1.3 Future Land Use and Zoning.

Much of the land in the study area in Brewer is zoned for rural uses (exhibit 3.25). Most of the land in Holden is zoned rural resource and residential development (exhibit 3.25). Since the circulation of the DEIS, Eddington updated its zoning ordinance. Most of the land in Eddington is zoned for agriculture and farming (exhibit 3.25). Areas zoned for residential and commercial uses exist along Route 9, Route 46, and other local roads (Town of Eddington, 2012). Most of the land in Clifton is zoned as agriculture or rural resource.

The No-Build Alternative would impact future land use and zoning. Future land use in the study area likely would consist of an extension of the existing permitted



Sources: 1) City of Brewer. Land Use Map. June 2010. 2) Town of Eddington. Zoning Ordinance. Enacted March 20, 2012.
 3) Town of Holden, Maine. Zoning Ordinance. Amended December 21, 2009. 4) Clifton Comprehensive Plan. Amended August 2005.

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land uses and trends and the future land use plans identified in the Brewer, Holden, and Eddington comprehensive plans. Without relief of traffic congestion, the No-Build Alternative likely would have an adverse impact on future business expansion and new development along Route 1A. With increased traffic volumes, the number of crashes experienced between vehicles entering and exiting businesses along Route 1A could increase.

Although a portion of the build alternatives would be in the limited commercial area along the Route 1A corridor, they are inconsistent with the comprehensive plans of Brewer, Holden, and Eddington because areas designated for rural resource/residential would be converted to transportation use (exhibit 3.26). Implementation of the build alternatives would detract from the rural character in the central and northern portions of the city of Brewer and the towns of Holden and Eddington.

By reducing traffic congestion, the build alternatives would have a beneficial impact on future business expansion and new development along Route

1A and, to a limited extent, along Route 9. The build alternatives would benefit the land uses along Route 46 from reduced traffic.

MaineDOT would work with the town of Eddington to maintain the safety and preserve the capacity of Route 9 in the study area. MaineDOT manages access points with Maine's rules governing access management (driveway and entrance siting). Safety, traffic congestion, and system linkage remains a priority concern of MaineDOT, as is preservation of the capacity of the existing highway system. Activities that could be considered to maintain safety and preserve the capacity of Route 9, in accordance with Maine's rules governing access management (driveway and entrance siting) can go no further than working with the town of Eddington to change zoning, eliminating existing and future curb cuts, and working with individual landowners to acquire property or development rights. That authority already exists to help both MaineDOT and the community ensure that safety is maintained in the corridor. MaineDOT has no authority

Exhibit 3.26 – Impacts to Land Use with Zoning Designations (acres)

	<i>Agriculture</i>	<i>Commercial</i>	<i>High-Density Residential</i>	<i>Medium-Density Residential</i>	<i>Low-Density/Rural Residential</i>	<i>Rural</i>	<i>Total¹</i>
No-Build							
2B-2/the Preferred Alternative	27	9	2	27	15	76	156
5A2B-2	28	18	2	29	17	112	206
5B2B-2	58	10	0	18	22	69	177

Note: ¹ Total acres do not include area in infrastructure/utility zoning designations or surface water.

beyond the existing rules to force Eddington to do anything to help reduce traffic conflicts, but MaineDOT is directed by statute to work with Eddington to ensure safety and proper access to the state highway system.

Today, the current AADT along Route 9 in Eddington between the terminus of the Alternative 2B-2/the Preferred Alternative and the Route 46 intersection is approximately 5,000 vehicles per day. The posted speed in this section of Route 9 is predominantly 45 mph, with 35 mph near the Route 46 intersection. Traffic on Route 9 can comfortably travel at the current posted speeds. This segment of Route 9 was constructed to a width that meets current NHS standards for 2-lane highways (12-foot travel lanes and 8-foot shoulders).

With Alternative 2B-2/the Preferred Alternative, the 2035 AADT along this segment of Route 9 is forecast to be approximately 12,000 vehicles per day. At that level of traffic flow, Route 9 can easily be maintained at the current posted speeds. There are many locations in Maine where AADTs of 15,000 to 17,000 are accommodated on 2-lane highways with 35-to-50 mph speeds. Many of these locations have more intense commercial development than Route 9 in Eddington. This indicates that traffic volume growth on Route 9 can be accommodated well beyond the year 2035.

As part of its planning process, MaineDOT regularly monitors traffic volume and traffic safety trends on all state highways, including Route 9. Traffic volumes are

updated every three years, and crash data is reviewed annually to identify emerging conditions that would compromise safety and mobility. MaineDOT regulates development access to Route 9 through application of access management rules. These rules require a new development to provide safe access and maintain adequate mobility on the highway.

One way of maintaining safety and mobility along Route 9 as future development occurs is by establishing turn lanes where needed to minimize conflicts between turning traffic and through traffic. This treatment improves the safety of turns while maintaining or improving the flow of through traffic. There are examples in Maine where AADTs of 17,000 to 19,000 are accommodated on 3-lane highways (which have a 2-way left turn lane between the through lanes) with 40-to-50 mph speeds. Route 9 is adaptable within the existing Right-of-Way to this type of treatment, if conditions warrant.

With the capacity to accommodate much more than the forecasted traffic, the regular monitoring of safety and mobility conditions by MaineDOT, and the ability to accommodate additional development in a safe and efficient manner, the transportation benefits of Alternative 2B-2/the Preferred Alternative should be sustainable well beyond 2035.

MaineDOT would work with town officials and evaluate Route 9 for potential improvements to improve safety for pedestrians and bicyclists along Route

9. Providing safe access for pedestrians and bicyclists along the road system typically consists of paved shoulders, sidewalks in highly developed areas, high visibility crossings where warranted, and signage to help alert drivers of the presence of bicyclists and pedestrians on the road system. A road safety audit would be conducted in conjunction with town officials and residents to develop potential immediate and longer term improvements that the town can consider as options to improve safety for pedestrians and bicyclists.

3.5.1.4 Neighborhoods

Brewer is part of the Bangor, Maine, metropolitan area and is divided into the villages of South Brewer and North Brewer. Neighborhoods along Eastern Avenue in Brewer are Felts Brook Green, Timber Ridge, Winter Way, and Beech Ridge. Nature's Way is located along Lambert Road (City of Brewer, 1995). Route 1A divides the town of Holden into two parts: the southern portion and the northern portion.

The neighborhoods in Holden are Barrett Lane along Mann Hill Road; Brookfield Estates along Eastern Avenue; and the houses along Brian Drive, Eaton Ridge, and Gilmore Estates along South Road.

East Eddington exists within the town of Eddington. The neighborhoods are Rae Lorraine and Martin Lane along Main Road and Fifield Estates along Rooks

Road. Residents along the primary roads in the study area also define themselves as neighborhoods.

The No-Build Alternative would not impact community cohesion. A community is defined as a group of people living together because of geography, background, or heritage. The town of Holden reported that Route 1A, which bisects the town into southern and northern portions, acts as a physical barrier to community interaction. Increased congestion on Route 1A would increase this barrier effect.

The No-Build Alternative would not impact neighborhoods.

Alternative 2B-2/the Preferred Alternative and Alternative 5A2B-2 would bisect the five-lot Beech Ridge neighborhood in the city of Brewer (exhibit 3.27). These alternatives would be approximately 100 feet east of Winter Way. Alternative 5A2B-2 would be to the immediate west of the Pine Tree Mobile Home Park. Alternative 5B2B-2 would be to the immediate east of Felts Brook Green.

3.5.1.5 Community Facilities and Services

Community facilities and services are listed and discussed in the DEIS Section 3.4.1.5 (exhibit 3.28).

There is a weekly trash collection resulting in stop and go traffic along Route 9 and other roads in the study area.

Exhibit 3.27 – Impacts to Neighborhoods

	<i>Felts Brook Green</i>	<i>Brookfield Estates</i>	<i>Pine Tree Mobile Home Park</i>	<i>Brian Drive</i>	<i>Beech Ridge</i>	<i>Easton Ridge</i>	<i>Winter Way</i>	<i>Timber Ridge</i>	<i>Nature's Way</i>	<i>Barrett Lane</i>	<i>Rae Lorraine</i>	<i>Martin Lane</i>	<i>Fifield Estates</i>
No-Build													
2B-2/the Preferred Alternative													
5A2B-2													
5B2B-2													

Legend: Direct Impact Immediately Adjacent to Neighborhood Within 500 feet of Neighborhood

The No-Build Alternative would not impact educational facilities. Over time, increased traffic volumes and congestion could impact the safety of students traveling along Routes 1A, 9, and 46 in proximity to schools. In general, the build alternatives would have a positive impact on student safety by reducing through traffic, including heavy-truck traffic, along school-bus routes. This benefit would be particularly evident on Route 46 (particularly the Holbrook School and Camp Roosevelt Scout Reservation along Route 46), given its terrain and more restricted sight distance. The build alternatives would increase traffic west of Eddington School.

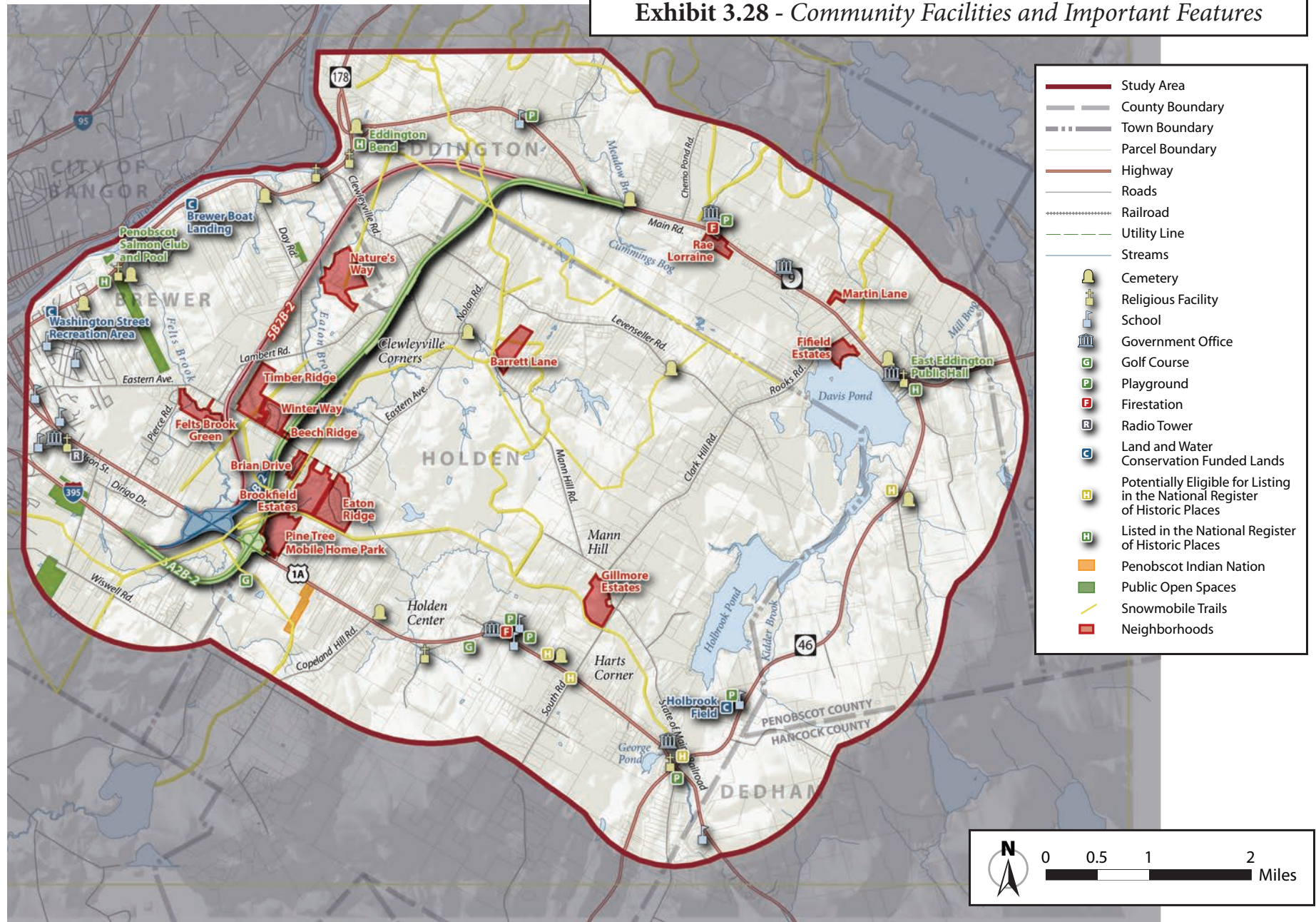
The No-Build Alternative would not impact emergency facilities. Over time, increased traffic volumes and congestion could impact response times of emergency responders.

The build alternatives would positively impact emergency facilities by reducing traffic along Route 1A and a corresponding decrease in emergency vehicle response times. Emergency response services (e.g., fire, police, and ambulance) would benefit from a reduction in traffic congestion on Route 1A from the build alternatives.

The No-Build Alternative and the build alternatives would not impact healthcare facilities.

The No-Build Alternative and the build alternatives would not impact trash collection. Route 9 has sufficient shoulder width to allow trash trucks to operate on the shoulder of the road and vehicles to operate in the travel lane.

Exhibit 3.28 - Community Facilities and Important Features



3.5.1.6 Recreation Lands

Part of Maine's Interconnected Trail System (ITS) for snowmobiles crosses through Brewer and Holden (exhibit 3.28)(Maine Snowmobile Association, 2008).

The No-Build Alternative would not impact snowmobile trails.

The build alternatives would cross snowmobile trails maintained by the Eastern Maine Snowmobile Association (MSA) in three to six locations. Alternative 2B-2/the Preferred Alternative would have the least impacts to snowmobile trails by crossing the trails three times, Alternative 5A2B-2 would cross them six times, and Alternative 5B2B-2 would cross them five times. During final design of the selected alternative, MaineDOT would work to maintain the integrity of the existing snowmobile trail system.

3.5.2 Social and Economic Environment

3.5.2.1 Employment and Industry Trends

Construction of one of the build alternatives would create direct, indirect, and induced employment. Direct employment includes workers employed at the highway construction site. Indirect employment includes off-site construction workers (e.g., administrative and clerical) and workers in construction supply industries (e.g., steel and cements products). Induced employment includes workers supported throughout

the economy when highway construction workers spend their wages (FHWA, 2008).

The FHWA estimates that for every \$1 million in highway infrastructure investment, approximately 28 full-time equivalent jobs are created. These jobs include approximately nine direct jobs, five indirect jobs, and 14 induced jobs (New England Council, 2008). This employment increase represents the total number of jobs created; although these jobs would not be created necessarily in Penobscot County, it is likely that a small increase in employment at the local and county levels would result.

Construction of the build alternatives would cost between \$61 million and \$81 million, creating approximately 1,700-2,300 full-time equivalent jobs.

The construction of the build alternatives would improve the viability of public and private investments in the Ports of Eastport, Searsport and Bucksport through improved connectivity to the interstate system.

3.5.2.2 Retail Businesses

The No-Build Alternative would adversely impact retail businesses along Route 1A. Traffic congestion, including travel-time delays and difficulty in left-turning movements, adversely affects customers' ability to access and exit businesses along Route 1A. Over time,

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as congestion worsens, customers may avoid patronizing some businesses along Route 1A.

Although motorists could continue to use the existing roads and travel patterns, the build alternatives would provide an opportunity or choice for travelers to bypass businesses along Route 1A in Holden and Route 9 in Eddington, thereby potentially reducing impulse purchases.

A literature review summarizing the effects of bypasses on communities was compiled. The reviewed research included studies of more than 270 bypassed communities with varying size, demographic composition, and economic characteristics. It was conducted in 1996 by the National Cooperative Highway Research Program (NCHRP), University of Kansas, Washington State University, University of Texas at Austin, and both the Wisconsin and Iowa Departments of Transportation. Data collected ranged from interviews concerning local opinions to origin/destination surveys to statistical analyses and economic impact modeling. The studies summarized in the literature review found that the majority of bypassed towns do not suffer adverse economic impacts from a bypass. According to the studies, a bypass can cause negative impacts to traveler-oriented businesses in a community, but the probable likelihood and severity of these negative impacts differed among studies. More

recent studies indicate similar findings (Babcock and Davalos, 2004).

A bypass can result in decreased business for some local businesses, particularly traveler-oriented businesses in communities with populations of fewer than 1,000 people. However, adverse effects do not occur in most traveler-oriented businesses. Sales at traffic-serving businesses along the bypassed route declined in less than 30 percent of cases studied (Buffington et al., 1996).

In 64 percent of cases studied by the NCHRP, overall business activity grows more rapidly where bypasses have been constructed than in comparable “control” communities that are not bypassed (Buffington et al., 1996). Some of this growth may be a reason for construction of the bypass rather than an effect of the bypass.

The Oklahoma DOT (2001) assessed the impact of bypasses on small Oklahoma towns located along U.S. Highway 70. Much of the study was devoted to the development of models to analyze the impact of bypasses; the application of the model to Oklahoma towns with bypasses was limited. The authors concluded that the bypasses did not have a statistically significant impact on the sales-tax base in the affected towns (Rogers and Marshment, 2001).

In nearly all of the communities studied by the NCHRP, the amount of land in commercial or industrial use increased along existing routes (i.e., in 93 of

98 cases) (Buffington et al., 1996). Land values were found to increase along the original route in 47 of the 50 cases studied by the NCHRP; the rates of decline were no greater than 2.4 percent for the remaining three cases (Buffington et al., 1996).

According to the University of Texas at Austin study, negative impacts to traveler-oriented industry sectors begin when certain critical values of traffic reduction are reached: 31 percent for retail sales, 26 percent for eating and drinking places, and 43 percent for service industries. Gasoline service stations are negatively impacted regardless of the level of traffic loss (a finding qualitatively supported in the majority of studies).

The Iowa DOT, Wisconsin DOT, and Washington State University also highlighted the beneficial impact of reduced traffic congestion on a bypassed route. The Iowa DOT found that due to the decrease in through traffic, traffic congestion, and crash rates along the bypassed route, the bypassed business district becomes a more comfortable and safer place to shop. The Wisconsin DOT found that bypasses improved overall accessibility to and from the bypassed communities. The Washington State University and University of Kansas found that bypass routes that improve access to major trading centers may increase economic development opportunities for small towns and increase basic industries present. Growth in basic industry has an indirect benefit on local retail sales and service industries.

Several studies found that signage may reduce the negative impact of a bypass to businesses. The University of Texas Center for Transportation Research states that signs are a simple but potentially effective technique for minimizing negative impacts of a bypass on existing community businesses. The North Carolina Division of Community Assistance similarly noted in a 1991 report that adequate signage is important for minimizing negative impacts of a bypass (North Carolina Division of Community Assistance, 1991). Signage that informs through-travelers of a town's location, as well as businesses and points of interest, can increase the likelihood that travelers would stop.

The build alternatives would have a slight impact on retail businesses. The reduction of traffic along Routes 1A and 9 could cause a small decrease in sales and revenue for the commercial and retail businesses proportionate to the amount of long-distance through-traffic removed from these two highways. Traffic headed to Calais and the Canadian Maritime Provinces, especially truck-freight traffic, would use the build alternatives and bypass Route 1A and a portion of Route 9 in Brewer and Eddington. However, local commuters and tourists headed to destinations such as Acadia National Park would continue to use Route 1A, thereby providing sales and revenue opportunities for businesses. Convenience stores and gasoline service stations along Route 1A could experience a slight decrease in sales as

a result of less through-traffic, but this decrease is not projected to substantially impact sales or revenue.

The studies summarized in the literature review found that the majority of bypassed towns do not suffer adverse impacts. Holden and Eddington can be defined as medium-sized communities (i.e., 2,000 to 2,500 people) and Brewer can be defined as a larger community (i.e., more than 5,000 people). Results of the literature review indicate that traffic on the original route (bypassed) was greater than traffic on the bypass for medium and larger communities, which supports the conclusion that traveler- and traffic-oriented businesses along Routes 1A and 9 in Brewer and Eddington would experience few adverse impacts (i.e., loss of sales) from the build alternatives. Results of the literature review also indicate that the majority of retail businesses had not moved from their pre-bypass locations, which suggests that most of the retail businesses along Routes 1A and 9 likely would not relocate.

The removal of a substantial portion of heavy-truck traffic and other through-traffic along Route 1A and a portion of Route 9 in Brewer and Eddington would improve access safety and reduce traffic congestion for customers of businesses along these two highways.

3.6 Coastal Zone Management Act and Probable Consistency Determination

The I-395/Route 9 Transportation Study is a major federal action and a portion of the study area is located in Maine's statutory coastal zone. As such, it requires a federal consistency review under the CZMA. Under the CZMA, the Maine Department of Agriculture, Conservation, and Forestry, Division of Geology, Natural Areas and Coastal Resources is delegated the authority to perform the federal consistency review using their enforceable policies of the approved Maine Coastal Program (MCP).

Maine's coastal zone encompasses political jurisdictions that have land along the coast or a tidal waterway, such as a river or bay. The City of Brewer in the study area is included in Maine's coastal zone. The enforceable policies of the MCP are the 29 Maine statutes listed in Appendix A of the Maine Guide to Federal Consistency Review, Maine Coastal Program, 4th Edition – Update 2, January 2013, including the Natural Resource Protection Act, Erosion Control and Sedimentation Law, Maine Rivers Act, and Coastal Management Policies Act http://www.maine.gov/dacf/mcp/downloads/Final_Maine_Guide-Federal_Consistency_Review_4thed_update2.pdf.

The natural resources and features identified and discussed throughout Chapter 3 are considered in the federal consistency review, as are the potential impacts to them.

MaineDOT's coordination with federal, state, regional, and local agencies and interested parties is ongoing for the I-395-Route 9 Transportation Study. The FHWA and MaineDOT have determined the proposed action described in this FEIS is consistent with the CZMA and the consideration and protections it affords to natural resources and features. A full federal consistency review would be provided with the review and issuance of the NRPA permit.

3.7 Relationship between Short-Term Uses of the Human Environment and Enhancement of Long-Term Productivity

The No-Build Alternative would have a short-term impact on the human environment from regular maintenance of I-395 and Routes 1A, 46, and 9. The No-Build Alternative would have a detrimental impact on long-term productivity on the environment of the study area and region because increasing traffic congestion would lead to an increased congestion and decreased mobility for travelers on Routes 1A, 46, and 9 over the long term.

The build alternatives would have a short-term adverse impact on the human environment but would enhance long-term productivity. The proposed transportation improvements are based on the State of Maine's long-term transportation improvement plan and program, which considers the need for present and future connectivity and traffic requirements within the context of present and future land-use development. The build alternatives are generally similar and would have similar short-term impacts. Short-term uses of the human environment would occur during construction. A build alternative would require staging areas, stockpiling areas, roadway construction, and a temporary increase in traffic around construction areas. Additional short-term impacts would be air-quality degradation from increased emissions from construction activities, noise impacts, and socioeconomic and community impacts from construction effects (e.g., roadway obstruction, traffic detours, and construction debris).

Transportation projects consider state and local comprehensive plans, which acknowledge the present and future traffic requirements based on current and future land-use development. The purpose of the build alternatives is to increase long-term productivity. The projected reduction in traffic congestion on Routes 1A, 46, and 9 and the resulting savings in VHT show that the local short-term impacts and use of resources by the proposed

action are consistent with the maintenance and enhancement of long-term productivity in the study area.

The build alternatives would assist in improving the long-term regional connectivity, as well as productivity of DownEast Maine by linking I-395 and Routes 1A, 46, and 9.

3.8 Irreversible and Irretrievable Commitment of Resources

Implementation of the build alternatives entails a commitment of a range of natural, physical, human, and fiscal resources. The commitment of these resources generally would be similar for each of the build alternatives. Land acquired in the construction of a build alternative is considered an irreversible commitment during the period that it is used for a highway facility. However, if a greater need arises for use of the land or if the highway facility is no longer needed, the land can be converted to another use. There is no reason to believe that such a conversion would ever be necessary or desirable.

Considerable amounts of fossil fuels, labor, and highway-construction materials (e.g., cement, aggregate, and bituminous material) would be expended during construction. Additionally, labor and natural resources would be used in the fabrication and preparation of construction materials. These materials

generally are not retrievable. However, they are not in short supply and their use would not have an adverse effect on continued availability of these resources. Any construction would also require a substantial one-time expenditure of both state and federal funds that are not retrievable.

The commitment of these resources is based on the concept that residents in the immediate area, state, and region would benefit from the improved quality of the transportation system. The benefits would consist of improved mobility, safety and savings in time.

3.9 Indirect Impacts and Cumulative Impacts

3.9.1 Indirect Impacts

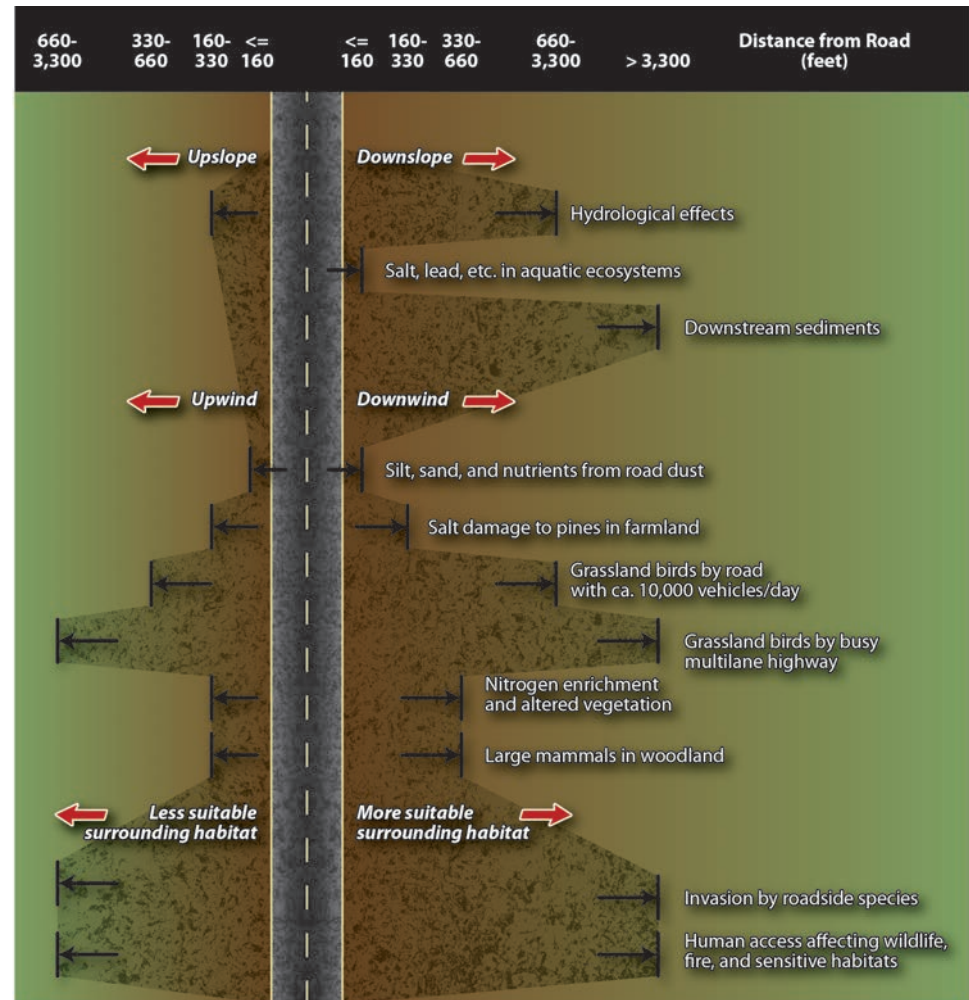
Indirect (or secondary) impacts are defined as reasonably foreseeable future consequences to the environment that are caused by the proposed action but that would occur either in the future (i.e., later in time) or in the vicinity of but not at the exact location as direct impacts associated with the build alternative. In the Council on Environmental Quality regulations, indirect impacts are defined as those that are "... caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect impacts include growth-inducing impacts and other impacts related to induced changes in the pattern of land use, population density or growth rate,

and related impacts on air and water and other natural systems, including ecosystems” (40 CFR 1508.8b).

Traffic noise, visual disturbance, chemicals, and pollutants create indirect impacts particularly to aquatic systems, wildlife, and wildlife habitat (Maine Audubon Society, 2007) (exhibit 3.29). The build alternatives create a road-effect zone in which indirect impacts extend beyond the road and the immediate surrounding areas (exhibit 3.30). Distances of indirect impacts to the natural environment were based on these road-effect zones and the USACE *New England District Compensatory Mitigation Guidance*. Distances used to analyze indirect impacts were based on the minimum distance for that resource (Maine Audubon Society, 2007; USACE, 2010), with the exception of resources with distances of zero to 160, in which 160 was used. Wetlands and vernal-pool impacts were based on the indirect impact distances in the USACE’s mitigation guidance.

Soils. Indirect impacts of the build alternatives on soils would vary in scale depending on the preferred alternative. Changes to soil in specific areas would impact soil-dependent species (i.e., vegetation and wildlife). Erosion from cut slopes would affect water quality in surface waters during and after construction. Erosion and sedimentation control measures would be incorporated into the design and implemented

Exhibit 3.29 – Approximate Distances of Road-Effect Zones



Source: Maine Audubon Society, 2007

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Exhibit 3.30 – Indirect Impacts of Alternatives

Resources		Distances (feet)		Alternative Indirect Impacts (acres)							
		Upslope/ Upwind	Downslope/ Downwind	No-Build Alternative ⁴ Upslope	No-Build Alternative ⁴ Downslope	2B-2/the Preferred Alternative Upslope	2B-2/the Preferred Alternative Downslope	5A2B-2 Upslope	5A2B-2 Downslope	5B2B-2 Upslope	5B2B-2 Downslope
Soils		Erosion could affect water quality in surface waters.									
Surface Waters	Contaminants	160 ¹		0.7		1.8		1.5		2.0	
	Sediments	0 ¹	3,300 ¹	12		0	13	0	18	0	17
Groundwater		No indirect impacts									
Aquatic Habitat and Fisheries		160 ¹		0.7		1.8		1.5		2	
Vernal Pools	Area	250 ²		54		17		25		8	
	25 (46%)			10 (60%)		20 (78%)		7 (83%)			
	17 (31%)			8 (47%)		20 (80%)		4 (50%)			
	37 (69%)			9 (53%)		5 (20%)		4 (50%)			
	Area	750 ²		480		278		395		146	
	254 (53%)			175 (63%)		233 (59%)		101 (69%)			
	101 (21%)			109 (39%)		177 (45%)		49 (34%)			
	379 (79%)			169 (61%)		218 (55%)		97 (66%)			
Floodplains		0	100 ³	0	1	0	11	0	5	0	15
		160 ¹		4		22		8		28	
Wetlands		0	100 ³	0	17	0	31	0	34	0	30
		160 ¹		64		66		71		80	
Vegetation	Contaminants	160 ¹		164		232		252		202	
	Nitrogen enrichment and altered vegetation	160 ¹	330 ¹	95	187	88	292	92	312	116	240
	Invasive species	660 ¹	3,300 ¹	753	3,920	329	4,407	398	4,346	498	2,944
Wildlife	Large mammals	160 ¹	330 ¹	0	0	74	128	69	173	89	103
	Grassland birds	330 ¹	660 ¹	0	80	146	250	136	334	178	204
	IWWH	0	100 ³	0	2	0	10	0	19	0	4
Wildlife Habitat		660 ¹	3,300 ¹	84	2,189	278	1,416	255	1,669	423	893

Notes:

¹Source: Maine Audubon Society, "Conserving Wildlife On and Around Maine's Roads", 2007.

²Source: USACE, New England District, "Compensatory Mitigation Guidance", 2010.

³ USEPA, 2010

⁴ No-Build Alternative consisted of Route 1A from I-395 to Route 46, and Route 46 from Route 1A to Route 9.

during construction in accordance with Section II of the MaineDOT's *Best Management Practices Manual for Erosion and Sedimentation Control* (MaineDOT, 2008a). Redundancy of controls would be included in each watershed that would be impacted to minimize potential control failures that could deliver sediment-laden runoff to streams during and after construction.

Surface Waters. An increase in the potential for sediment loading and roadway contaminants introduced to surface waters exists for the No-Build Alternative and the build alternatives. Impacts from sedimentation caused by construction would be temporary. During final design, a highway drainage system would be designed to minimize the transport of sediments and other particulates to surface waters. Erosion and sedimentation control measures would be incorporated into the design and implemented during construction in accordance with Section II of the MaineDOT's *Best Management Practices Manual for Erosion and Sedimentation Control* (MaineDOT, 2008a) and designed in accordance with the MDEP/MaineDOT Memorandum of Agreement, Stormwater Management, November 14, 2007 and Chapter 500 Rules. Redundancy of controls would be included in each watershed that would be impacted to minimize potential control failures that could deliver sediment-laden runoff to streams.

As part of winter maintenance, anti-icing chemicals with chlorides (i.e., primarily rock salt) are used to combat the effects of snow, sleet, and ice. The use of anti-icing materials for winter maintenance would not impact the availability of potable water supplies. MaineDOT investigates and evaluates snow and ice-control industry standards and updates its salt-priority program to use salt judiciously while providing safe and effective traffic movement. In the unlikely event that a localized issue is observed, MaineDOT would implement corrective actions as mandated by state law (23 MRSA § 652). The project would be designed in compliance with applicable Maine water quality standards and with the requirements of the Section 401 Water Quality Certification.

MaineDOT has collaborated with the Margaret Chase Smith Policy Center at the University of Maine to publish a study entitled MaineDOT's winter maintenance activities: Maine Winter Roads: Salt, Safety, Environment and Cost. The goals identified in the study include: maintain safety while reducing salt and sand use; reduce salt use through improved practices, new materials and equipment, and changes in levels of service; and increase public awareness of winter practices, costs, and environmental impacts. The key findings from the study are:

- Anti-icing practices are being widely adopted by state agencies across the U.S. MaineDOT,

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Maine Turnpike Authority and some municipalities have incorporated anti-icing practices.

- Eighteen percent of the State of Maine's public roads are maintained by MaineDOT, one percent by the Maine Turnpike Authority with the remaining eighty one percent being maintained by 488 municipalities and three Indian reservations.
- Using federal guidelines for the costs of injuries and deaths, Maine accident data show a 10 year average cost of \$1.5 billion dollars annually.
- In winter months between 1989 and 2008, there was a significant reduction in the number of fatalities on state highways. This reduction does not occur on town roads and state-aid highways. This is consistent with the finding of a statistically significant decrease in fatalities on state highways since MaineDOT's anti-icing policy was implemented. It is unknown whether the anti-icing policy is the cause of the decrease.

Since the mid-1990s MaineDOT has adopted procedures recommended by the FHWA for anti-icing. MaineDOT uses anti-icing chemicals to maintain safer roadways for the traveling public. MaineDOT is continually investigating and evaluating snow and ice control methods, and updating its maintenance program to balance maintaining water quality with providing safer conditions for the public. Early

application of salt brine and rock salt are being used on many roads to prevent snow and ice from bonding to the road surface. This anti-icing application reduces the amounts of anti-icing chemicals used. This approach reduces the amount of chlorides and sodium in highway runoff. MaineDOT snow and ice control operations are guided by a policy which classifies the level of service of roadways by priority corridors. Each level of service has a defined cycle of service time, plow route length, and prescribed amount of time to return the road to normal winter driving conditions.

- Priority 1 corridors (26% of total miles maintained by MaineDOT) would be treated and bare pavement provided following a storm as soon as practicable, at most within 3-6 daylight hours.
- For Priority 2 corridors (36% of total miles maintained by MaineDOT) bare pavement would be restored as soon as practicable after Priority 1 corridors, and within 8 daylight hours. Pre-treatment is provided on Priority 1 and 2 corridors to prevent ice from bonding with the road surface.
- Priority 3 corridors (38% of total miles maintained by MaineDOT) are treated within 24 hours, providing one-third bare pavement in the middle of the road as soon as practicable. For Priority 3 corridor sand routes, roads would

be plowed and sand applied, yet the road surface may be snow covered during a storm.

MaineDOT practices pre- and post-construction sampling of potable water supplies to ensure that any impacts from construction are noted and remediated. MaineDOT is required by law to remediate any impacts to potable water supplies from winter maintenance activities. MaineDOT's winter maintenance program is centered on minimizing the use of any anti-icing chemical; however, when necessary for public safety, MaineDOT uses Ice-B-Gone, which was noted by EPA to be a "green" anti-icing material.

Anti-icing salts can impact groundwater in ways similar to surface waters.

Aquatic Habitat and Fisheries. Indirect impacts would result from the disruption of aquatic-organism passage. This may result in the reduction of upstream populations of stream-dependent organisms. Long-term impacts to the fisheries are not likely as long as aquatic-organism passage is maintained and best management practices are used to prevent short- and long-term erosion and sedimentation (MaineDOT, 2008a).

Potential erosion and sedimentation from construction of road-stream crossings would impact water quality and aquatic habitat and fisheries would occur

within 160 feet. Erosion and sedimentation control measures would be incorporated into the design and implemented during construction in accordance with Section II of the MaineDOT's *Best Management Practices Manual for Erosion and Sedimentation Control* (MaineDOT, 2008a).

Vernal Pools. Amphibians commonly disperse more than 750 feet from a vernal pool into upland and wetland forested (generally) habitat. The NRPA rules (effective in September 2007) regulate a 250-foot critical habitat area around "significant" vernal pools. Each vernal pool was identified and analyzed with a uniform 250-foot and a 750-foot radius. Land area that would be removed within the 250-foot radius and 750-foot radius was considered an indirect impact. The impacts to vernal pools range from 8 acres to 25 acres for the 250-foot radius and from 146 acres to 278 acres for the 750-foot radius (see exhibit 3.30).

Floodplains and Wetlands. Indirect impacts to floodplains and wetlands would occur at a certain distance from the edge of permanent disturbance (i.e., grading cut-and-fill boundary) necessary to construct the build alternatives. Within this area, changes in the value and/or function of wetlands would be altered due to changes in adjacent land use and topography.

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The USACE recommendation for water quality-protection prescribes an effective area width of 100 feet, which provides adequate filtering of runoff to trap sediments and pollutants that affect water quality. The range of area width is tied to adjacent slopes, where for low to moderate slopes, the majority of effective filtering occurs within the first 30 feet.

The USACE recommendation for stabilization protection prescribes an effective area width of 30 to 65 feet. This width is generally adequate to attenuate overland flow and regulate soil moisture-conditions to maintain adequate soil stability.

The build alternatives would indirectly impact between 66 and 80 acres of land within 160 feet of identified wetlands. Indirect impacts to wetlands would consist of changes to hydrology to existing wetlands, sediment input to wetlands adjacent to earthwork, and shading. Shading is most likely to occur where new bridges are constructed. Shading impacts to vegetation can reduce or eliminate wildlife habitat and water-quality functions. Shading can lower water temperature. Wetlands that are not directly filled or excavated but in which their functions have been reduced are also indirect impacts. Habitat functions of wetlands can be indirectly impacted (see section 3.2.2.4).

Vegetation. Vegetation along existing and new highway right-of-ways tends to be disturbed and exhibit a higher

percentage of exotic or invasive plant species. Roadways often introduce invasive plant species (e.g., purple loosestrife and Eurasian milfoil) that can degrade wildlife habitat. The build alternatives have the potential to introduce invasive species in areas previously vegetated with native species as well as nitrogen enrichment and altered vegetation. The build alternatives have the potential to introduce roadway contaminants (e.g., salt and lead) to vegetation. The build alternatives have an indirect impact of cover type conversion along the right-of-way in excess of that needed for the roadway footprint. The operation of traffic on the build alternatives and maintenance of the right-of-way have the potential to alter the vegetation communities adjacent to it.

Wildlife and Wildlife Habitat. The types and number of animals killed by vehicles are related to road width, traffic volume, vehicle speed, and location of the road in terms of wildlife habitat, particularly travel corridors or migration habitat for particular species. Amphibians and reptiles have the highest mortality rates on two-lane roads with low to moderate amounts of traffic, whereas large and midsize mammals are more susceptible to collisions on two-lane, high-speed roads. Birds and smaller mammals are more at risk from collisions on wider, high-speed highways. In addition, roads through and adjacent to wetlands, ponds, and other waterways have some of the highest road-kill rates. Although wildlife-vehicle

collisions do not put the health of large-mammal populations (e.g., deer and moose) at risk, these collisions pose a hazard for motorists (Maine Audubon Society, 2007).

Road salt, particularly sodium chloride, is toxic to many species of plants, fish, and other aquatic organisms. In addition, concentrations of salt along roadsides attract deer and moose, thereby increasing the risk of collisions with vehicles.

Other indirect impacts are wildlife avoidance of roads, which can indirectly affect dispersal and breeding behavior and noise disturbance for wildlife along the roads. Traffic noise can interfere with the ability of songbirds to hear mating calls and recognize warning calls. Because noise travels farther in open habitats, a decrease in population density adjacent to roads is greatest for grassland birds, less for birds in deciduous woods, and least for birds in coniferous woods. Researchers found that negative impacts on the density and nesting success of grassland birds extend more than a quarter-mile from a rural road and more than a half-mile from a highly traveled, four-lane highway (Maine Audubon Society, 2007).

Indirect impacts to wildlife habitat from the build alternatives are the creation of smaller undeveloped habitat blocks, which have value as roosting, foraging, or cover habitat for some species tolerant of disturbance (e.g., deer, raccoon, and certain birds).

Roads in or through a natural area result in the “edge effect,” thereby reducing its value for area-sensitive

species. Where roads are built, habitat is lost or changed. In addition, roads increase human access to natural areas, resulting in increased human disturbance (Maine Audubon Society, 2007).

Chemicals introduced along roadways from vehicles, anti-icing salts, road-surface wear, and herbicide and pesticide use can pollute wildlife habitat by providing a source of heavy metals, salt, organic pollutants, and excessive nutrients. Such water and soil pollution poses a lethal risk to wildlife that depends on the resources. Contamination of soil, plants, and animals extends as much as 66 feet from a road, and elevated levels of heavy metals often extend 650 feet or more from the road, occurring in greater concentrations along roads with high traffic volume (Maine Audubon Society, 2007).

Land Use. The No-Build Alternative would result in continued adverse impacts to land use. Over time, traffic volumes along Routes 1A, 9, and 46 through the study area would increase, resulting in longer delays and more congestion. As traffic volumes increase, more local traffic would divert to local roads seeking alternate routes to bypass the traffic congestion in and approaching the study area. Increasing traffic volumes on local roads would lead to more congestion and longer delays for motorists, as well as a general decrease in the quality of life. The increased congestion and delay would further exacerbate

existing conditions that make it difficult for businesses to thrive and residents to travel unimpeded.

3.9.2 Induced Development or Growth

Another form of indirect impacts – induced development or growth – can be associated with the consequences of land-use development that would be indirectly supported by changes in local access or mobility. Induced development would include a variety of alterations such as changes in land use, economic vitality, property value, and population density. The potential for indirect impacts to occur is determined in part by local land-use and development-planning objectives and the physical location of a proposed action.

The build alternatives would have controlled access, without access to local roads, except for the interchange at Route 1A near the Brewer–Holden boundary, and Route 9 east of Route 178 (Chapter 2).

Because the build alternatives are intended to serve long-distance through- and regional-traffic, development induced by them likely would be traveler-oriented businesses (e.g., commercial uses such as gasoline stations, motels, restaurants, and convenience stores) within approximately a half-mile of the interchanges and intersections. The farther removed in distance and time from the interchange and intersection, the less induced growth effects can be expected. Oregon DOT's *Guidebook for Evaluating the Indirect Land Use and Growth Impacts of*

Highway Improvements recommends studying a half-mile radius surrounding a highway improvement as the primary area of induced growth (Oregon DOT, 2001).

The affected area of induced growth is limited because the build alternatives would have controlled access, the population growth rate in the study area is low, and local zoning precludes intensive development. The projected population for 2020 is expected to experience minor changes from existing levels: Brewer is projected to experience a decrease in population of about 0.8 percent; Holden is projected to experience an increase in population of about 8 percent; and Eddington is projected to experience an increase in population of about 5.7 percent by 2020. Most of the land in the study area is zoned agricultural and rural residential limiting development. Development would occur in the study area, whether or not the build alternatives are constructed.

Assuming that induced development would occur within this distance, a worst-case analysis of land use was conducted for areas surrounding the proposed interchanges and intersection.

The purpose of a general business zone in Brewer is to provide for various types of commercial uses, including highway-oriented uses. This zone is intended to be the location of the community's major shopping facilities, including shopping centers. The purpose of the general business zone in Holden is to provide locations for business activities requiring large-scale

buildings, large outdoor display and wholesale areas, and extensive site development to provide employment and services beyond the immediate neighborhood or community. Land adjacent to the I-395 interchange with Route 1A used by Alternative 2B-2/the Preferred Alternative and Alternative 5B2B-2 is zoned general business and rural by the city of Brewer and the town of Holden.

Land adjacent to the proposed interchange between Alternative 5A2B-2 and Route 1A is zoned rural and general commercial by the city of Brewer and the town of Holden.

The town of Eddington's commercial zone is intended primarily for commercial uses to which the public requires easy and frequent access. The residential B zone is established as a zone for residential use of existing housing and new multifamily housing. The agricultural zone is intended for the types of uses that traditionally predominate in rural Maine: forestry and farming, farm residences, and a scattering of varied uses consistent with a generally open, non-intensive pattern of land use.

Land adjacent to the proposed intersection of Route 9 and the build alternatives is zoned commercial and residential B by the town of Eddington.

A build-out analysis was performed using the following method:

1. The geographic boundary for the analysis was an area within a half-mile of the interchange with Route 1A and the intersection with Route 9.
2. The lots that fall within that area were identified.
3. Lots that would not be built on (e.g., because they are too small or are wetlands) were removed from the analysis.
4. Zoning for each lot was identified.
5. The total number of structures permitted by the zoning ordinance was determined; existing structures were subtracted and the number of new structures were determined.
6. The lots, their land uses, and the number of acres most susceptible to secondary impacts from induced development were determined.
7. Only the parcels with road frontage were projected to be subdivided and built out.

Based on the analysis of the interchanges and intersection, each interchange could impact between 14 and 19 acres of forest and grassland areas in the general business zone in Brewer and Holden (exhibit 3.31). The number of new businesses is unknown because the purpose of zoning is to provide for various commercial uses such as shopping facilities with an unknown number of businesses. The intersection could result in 16 new residences within a half-mile.

Alternative 2B-2/the Preferred Alternative and Alternative 5B2B-2 could induce development that may impact wetlands; up to 2 acres of wetlands (1 acre at the interchange with I-395 and 1 acre at the intersection with Route 9) could be impacted. Alternative 5A2B-2 could induce development that may impact up to 1 acre of wetlands (at the intersection with Route 9).

If induced development in the areas with the new interchanges and intersection was primarily commercial and traveler-oriented businesses, it would be generally consistent with existing land uses and zoning. The impacts to existing residential uses from induced development (if the existing uses are

not converted to commercial or other use) would consist of an increase in the suburban character of the area from increased development, with the associated aesthetic impacts on neighboring residents.

Commercial and residential development would occur with the No-Build Alternative; however, it could occur more quickly with the build alternatives because of the strong connection between transportation and land use. Because commercial and residential development would occur without implementation of a build alternative, it would not be considered a secondary impact solely related to the build alternatives. Other dynamic regional economic and development trends would have a more important influence on the establishment of those uses than construction of the build alternatives. The city of Brewer and the towns of Holden and Eddington would control new development in those areas through their planning and approval processes. Development would be guided by local comprehensive plans and zoning ordinances.

Exhibit 3.31 - Potential Induced Development by Alternative within a Half- Mile of Interchanges and Intersections

	Interchange at Route 1A	Intersection at Route 9 between Chemo Pond and Davis Roads
No-Build		
2B-2/the Preferred Alternative	Permitted uses within general business district (Approximately 19 acres forested and grassland)	16 Residences (16 acres forested and grassland)
5A2B-2	Permitted uses within general business district (Approximately 14 acres forested and grassland)	16 Residences (16 acres forested and grassland)
5B2B-2	Permitted uses within general business district (Approximately 19 acres forested and grassland)	16 Residences (16 acres forested and grassland)

3.9.3 Cumulative Impacts

Consideration of cumulative effects entails an assessment of the total effect on a resource or ecosystem from past, present, and future actions that have altered the quantity, quality, or context of those resources within a broad geographic scope. Under the Council on Environmental Quality regulations, cumulative

effects are defined as “...the impact on the environment which results from the incremental impact of the actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR 1508.7). The cumulative-effects analysis considers the aggregate effects of direct and indirect impacts – from federal, non-federal, public, or private actions – on the quality or quantity of a resource.

The intent of the cumulative-effects analysis is to determine the magnitude and significance of cumulative effects, both beneficial and adverse, and to determine the contribution of the proposed action to those aggregate effects. Contributions to cumulative effects from the build alternatives on resources is limited to those that are substantially impacted. Therefore, cumulative effects on the following resources were analyzed:

- surface waters and floodplains
- wetlands and aquatic habitat
- vegetation and wildlife

The cumulative impact of the proposed action to climate change was considered. Because the build alternatives would result in a slight reduction of CO₂ emissions, no further analysis was conducted.

The study area used to analyze cumulative effects was defined as the areas where past, present, or future actions would impact surface waters, floodplains, wetlands, and aquatic habitat. This area encompasses most of the city of Brewer and the towns of Holden and Eddington and includes small portions of the towns of Clifton, Dedham, Bradley, and Orrington. The study area used for the analysis of cumulative effects for these resources consisted of approximately 73 square miles (exhibit 3.32).

The year 1987 was used as the limit for the timeframe of past actions considered. It was chosen because the extension of I-395 from I-95 to Route 1A was completed and opened to traffic in late 1986. The I-395 extension influenced the study area by providing easier regional access to Brewer, Holden, and Eddington. The 2035 design year of the build alternatives was used as the future limit for the cumulative-effects discussion.

The past, present, and reasonably foreseeable future actions in the study area were identified and the environmental consequences of these actions on the resources were analyzed (exhibit 3.33). Reasonably foreseeable future actions were limited to those for which a plan or study was completed or funding has been committed, and anticipated environmental impacts can be at least qualitatively characterized. Other actions that would occur would be the continuing practice of agriculture and logging, and while these

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Exhibit 3.32 - Cumulative-Effects Study Area

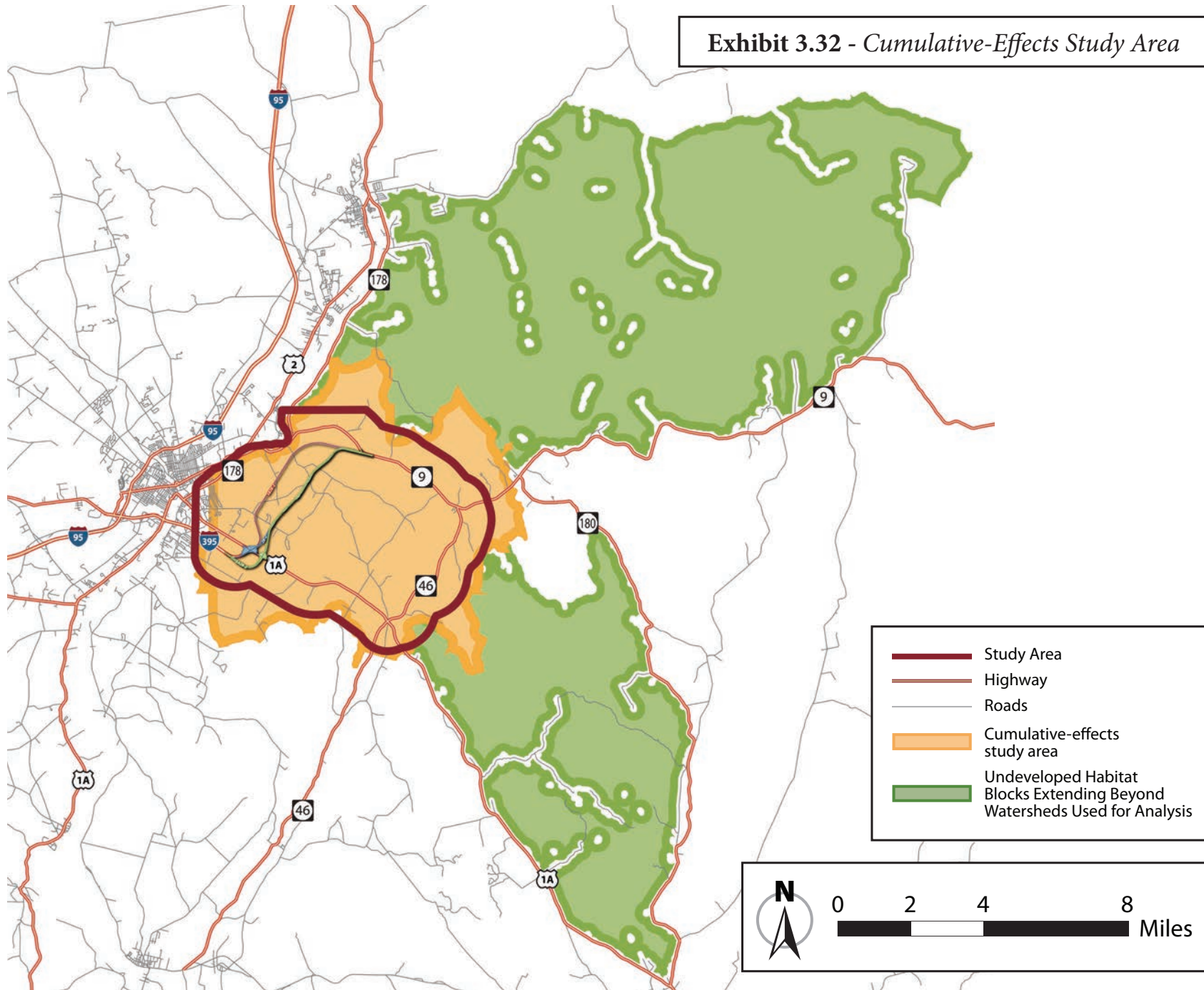


Exhibit 3.33 - Cumulative Impacts

<i>Past, Present, and Reasonably Foreseeable Actions</i>	<i>Direct Impacts</i>				
	<i>Surface Waters</i>	<i>Floodplains (acres)</i>	<i>Wetlands (acres)</i>	<i>Vegetation</i>	<i>Wildlife Habitat (acres)</i>
Past Actions 1987-2010					
Extension of I-395 from Main Street, Bangor, to Route 1A, Brewer (November 1986)	200-foot impact to unnamed tributary to Felts Brook		Unknown	Conversion of 72 acres of rural land to transportation use	Unknown
Holden: Continued development of DeBeck Business Park (approximately 44-acre site)	Increase in impervious surfaces affecting stormwater runoff	5	3	Conversion of 6 acres of forests/vegetation land to commercial use	7
Brewer: Walmart Supercenter off of outer Wilson Street (approximately 3.6-acre site)			3		
Brewer: Construction of parallel service road along Wilson Street (Route 1A)			Unknown	Conversion of 10 acres of urban/suburban land to transportation	
Brewer: Penobscot Landing Trail preliminary engineering and right-of-way acquisition					
Brewer: Beech Ridge - approximately 4 residential lots (approximately 6.8-acre site)	Increase in impervious surfaces affecting stormwater runoff			Conversion of 8 acres of forests/vegetation land to residential use	
Brewer: Nature's Way - approximately 15 residential lots (approximately 93-acre site)	Increase in impervious surfaces affecting stormwater runoff; 332-foot impact to Eaton Brook and an unnamed tributary to Eaton Brook	3	11	Conversion of 31 acres of forests/vegetation land to residential use	
Brewer: Timber Ridge - approximately 19 residential lots (approximately 72.6-acre site)	Increase in impervious surfaces affecting stormwater runoff		2	Conversion of 19 acres of forests/vegetation land to residential use	
Brewer: Felts Brook Green Phase I - approximately 5 residential lots (approximately 6.5-acre site)	Increase in impervious surfaces affecting stormwater runoff; 218-foot impact to Felts Brook	1	1	Unknown	
Brewer: Lowe's Home and Garden Center on Wilson Street (approximately 4-acre site)	Increase in impervious surfaces affecting stormwater runoff			Conversion of 5 acres of forests/vegetation land to commercial use	16
Brewer: Diringo Drive Office Park Phase I - approximately 25.4-acre site.			20	Conversion of 23 acres of forests/vegetation land to commercial use	
Brewer/Holden: Bangor Hydro-electric Company Northeast Reliability Interconnect Electric Transmission Upgrade		1	8	Conversion of 18 acres of forests/vegetation land to utility use	21

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Exhibit 3.33 – Cumulative Impacts (continued)

Past, Present, and Reasonably Foreseeable Actions	Direct Impacts				
	Surface Waters	Floodplains (acres)	Wetlands (acres)	Vegetation	Wildlife Habitat (acres)
Holden: Barrett Lane - approximately 9 residential lots (approximately 54.5-acre site)	Increase in impervious surfaces affecting stormwater runoff; 418-foot impact to unnamed tributary to Eaton Brook	2	19	Conversion of 54 acres of forests/vegetation land to residential use	
Holden: Brookfield Estates Phase I - approximately 16 residential lots (approximately 44.6-acre site)	Increase in impervious surfaces affecting stormwater runoff		4	Conversion of 42 acres of forests/vegetation land to residential use	
Holden: Gilmore Estates - approximately 6 residential lots (approximately 66-acre site)				Conversion of 43 acres of forests/vegetation land to residential use	
Eddington: Rae Lorraine - approximately 5 residential lots (approximately 27.3-acre site)			1	Conversion of 23 acres of forests/vegetation land to residential use	
Eddington: Martin Lane - approximately 5 residential lots (approximately 10.5-acre site)				Conversion of 7 acres of forests/vegetation land to residential use	
Eddington: Fifield Estates - approximately 8 residential lots (approximately 33.7-acre site)			20	Conversion of 32 acres of forests/vegetation land to residential use	
Holden: Natural Gas Compressor Station			Unknown	Unknown	
Present Actions 2011-2015					
Brewer: Brewer Professional Center - commercial and professional development (approximately 64.5 acres).	Increase in impervious surfaces affecting stormwater runoff		2	Conversion of 21 acres of forests/vegetation land to commercial use	
Brewer: Diringo Drive Office Park Phase II - commercial and professional development (Approximately 31.6 acres).			30	Conversion of 31 acres of forests/vegetation land to commercial use	
Reasonably Foreseeable Actions 2015-2035					
I-395 Connector - 2-Lane Highway: (2B-2/the Preferred Alternative, 5A2B-2, 5B2B-2)	Increase in impervious surfaces affecting stormwater runoff; 222- to 567-foot impact to surface water	2-11	26-32	Conversion of 14-20 acres of agricultural, 17-36 acres of grassland, and 71-85 acres of forests to transportation use	512-880
Improve the most heavily congested section of Route 1A from I-395 to Route 46 and the Intersection of Routes 46 and 9					

Exhibit 3.33 – Cumulative Impacts (continued)

<i>Past, Present, and Reasonably Foreseeable Actions</i>	<i>Direct Impacts</i>				
	<i>Surface Waters</i>	<i>Floodplains (acres)</i>	<i>Wetlands (acres)</i>	<i>Vegetation</i>	<i>Wildlife Habitat (acres)</i>
Brewer: Feltsbrook Green Phase II (approximately 38.2-acre site)	Increase in impervious surfaces affecting stormwater runoff; 1,589-foot impact to Eaton Brook and an unnamed tributary to Eaton Brook	3	2	Conversion of 7 acres of forests/vegetation land to residential use	
Holden: Brookfield Estates Phase II (approximately 49.3-acre site)	Increase in impervious surfaces affecting stormwater runoff; 1,831-foot impact to unnamed tributary to Felts Brook	1	30	Conversion of 48 acres of forests/vegetation land to residential use	
<i>Cumulative Effects for 2B-2/the Preferred Alternative</i>	<i>4,900 feet of streams; unknown impacts from stormwater runoff</i>	<i>26</i>	<i>182</i>	<i>600 acres to forests/vegetation</i>	<i>873</i>
<i>Cumulative Effects for 5A2B-2</i>	<i>4,900 feet of streams; unknown impacts from stormwater runoff</i>	<i>18</i>	<i>187</i>	<i>640 acres to forests/vegetation</i>	<i>924</i>
<i>Cumulative Effects for 5B2B-2</i>	<i>4,900 feet of streams; unknown impacts from stormwater runoff</i>	<i>27</i>	<i>188</i>	<i>600 acres to forests/vegetation</i>	<i>556</i>

impacts were not qualitatively characterized, they were acknowledged. Many of the future cumulative impacts on resources within the study area are projected to be generated by future residential and commercial development that cannot be fully characterized.

Potential cumulative impacts to those resources analyzed, with and without one of the build alternatives, would generally follow existing patterns and development trends. Residential and commercial development likely would continue to occur within the region at the same rate and with the same characteristics with either the No-Build Alternative or one of the build alternatives, and it would serve as the major source of land-use conversion and contribution to cumulative resource effects. Few other reasonably

foreseeable future actions were identified that would contribute to the cumulative impact of the resources analyzed.

Within the study area, population and housing are projected to grow at a slow rate from 2010 to 2020 (Maine State Planning Office, 2003; 2008a; 2008b). The most substantial changes are projected to occur in Holden (which has the highest growth rate in the study area of eight percent and the housing growth rate of 5.4 percent) and in Eddington (an increase of 5.7 percent in population and 8.8 percent in housing). Brewer is projected to experience a decrease of about 0.8 percent (approximately 71 fewer people) by 2020. These projections demonstrate the current land use trends in the study area, which show residents and housing moving from the more urban areas

in Brewer and other parts of Bangor to adjacent suburban and rural areas. Although the number of housing units is slowly increasing through 2015 with an overall growth rate of 5.1 percent, overall population growth in the study area through 2020 remains generally flat at 2.4 percent, demonstrating movement of the existing population within the study area rather than a large influx of new residents. The trend is supported by 2020 projections for the city of Bangor (the major population center in the region), which show housing-unit growth of 2.3 percent but a decrease in population equal to approximately -15.5 percent.

According to Maine's Beginning with Habitat program, unfragmented habitat blocks are defined as areas that encompass 100 acres and are at least 500 feet from development and improved roads (Beginning with Habitat, 2008). The area analyzed for vegetation and habitat encompasses approximately 296 square miles because it includes the unfragmented habitat blocks in their entirety that extend beyond the study area. The cumulative impacts of the build alternatives on unfragmented habitat blocks are between 550 and 925 acres.

Surface Waters and Floodplains. Surface waters have been and would continue to be influenced by land use and development. The cumulative effect of the past, present, and reasonably foreseeable future impacts consists of an increase in impervious surfaces. Cumulative

impacts on surface waters and floodplains would be largely influenced during the next 20 years by additional roadway and bridge construction. With the exception of construction of a build alternative, no new major roads are anticipated and local road and bridge projects are not expected to have a substantial effect on surface waters and floodplains. The build alternatives would add impervious surface to the study area. Residential and commercial development would have a continued effect on surface waters by increasing stormwater runoff as more impervious surfaces are created. Increased stormwater runoff would cause the water level of nearby streams to rise more quickly during storms.

The build alternatives would directly impact between approximately 200 feet of stream and two to 11 acres of floodplains. The cumulative effects of the past, present, and reasonably foreseeable future actions would impact approximately 4,900 feet of stream and 18 to 27 acres of floodplains. The cumulative effect of the past, present, and reasonably foreseeable future impacts to stormwater runoff result from an estimated 695-acre increase in impervious surfaces. The increase in surface water quantity would be accompanied by a decrease in surface water quality from non-point source pollutants (e.g., oil from automobiles) that are carried by stormwater runoff into receiving streams and the Penobscot River.

Buffers improve water quality by helping to filter pollutants in run-off both during and after construction.

Wetlands and Aquatic Habitat. Cumulative effects on wetlands and aquatic habitat are likely to continue as development occurs; however, important aquatic habitat would remain protected through conservation laws. The build alternatives would directly impact between 26 and 32 acres of wetlands. The cumulative effects of the past, present, and reasonably foreseeable future impacts to wetlands would be approximately 180 to 188 acres.

Future wetlands loss would be limited by state and federal laws protecting those resources through mandatory mitigation for both public and private initiatives. Important aquatic habitat is projected to remain protected through conservation laws; however, changes in the upstream watershed from increased suburban development would continue to affect water quality and habitat in the study-area water environments.

Vegetation and Wildlife Habitat. Vegetation and wildlife habitat would continue to decrease and habitat would become more fragmented as more land is converted from forest and grasslands to residential and commercial uses. The build alternatives would directly impact between 71 and 85 acres of forests. The cumulative effect of the past, present, and reasonably foreseeable future impacts to forested areas would be approximately 556 to 924 acres.

The decision to pursue residential and commercial development is influenced most by local and regional

development trends and prevailing economic conditions. Therefore, the difference in the cumulative-effects contribution of the No-Build Alternative and one of the build alternatives is limited to the difference in direct impacts associated with each build alternative.

The incremental impacts of any of the build alternatives are not expected to have a substantial effect on surface waters, floodplains, wetlands, vegetation, and wildlife habitat.

3.10 Mitigation and Commitments

This section describes the mitigation measures and commitments being considered in support of the development of Alternative 2B-2/the Preferred Alternative.

3.10.1 Mitigation

MaineDOT would mitigate the impacts to streams and vernal pools from Alternative 2B-2/Preferred Alternative. MaineDOT would coordinate with the federal and state regulatory and resource agencies during the development of the mitigation plan for impacts to streams, wetlands, vernal pools, and other natural resources.

Prospective compensatory mitigation opportunities for the unavoidable wetlands impacts from the build

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alternatives were identified within the Penobscot River and neighboring sub-watersheds. The build alternatives are largely on new alignments and no on-site opportunities exist to restore wetlands previously filled by highway construction. Opportunities were identified primarily through the use of existing reports, GIS information, and field data. Initial contacts were made with representatives from the MDIFW, MDOC, MDEP, Maine Forest Service, Maine State Planning Office, Penobscot River Restoration Trust, the Nature Conservancy, and the Forest Society of Maine to learn about local conservation initiatives that could provide suitable mitigation. These opportunities were specific restoration sites and broader areas identified as local or regional conservation priorities. The mitigation opportunities described here are conceptual and additional information would be prepared.

Felts Brook Parcel. This 120-acre site is located in Brewer and was acquired by the MaineDOT in 1982 as part of the I-395 construction project. The site consists of agricultural fields and wetlands. The mitigation potential consists of enhancement through planting of riparian vegetation, some potential creation opportunities, and preservation.

Lower Penobscot River Stream Barrier Removal. This study was conducted by the Maine Forest Service in cooperation with the USFWS and Gulf of Maine Coastal

Program. There are 287 crossings (the majority are culverts) surveyed in the Lower Penobscot drainage that have been identified as aquatic-organism barriers primarily due to structural deficiencies. Crossings surveyed consist of a variety of problems: inlet blockages, inlet drops, perched inlets and outlets, shallow water depths, high velocities, and lack of natural substrates. The most prevalent problem is perched outlets at 204 crossings. There are numerous opportunities identified in this study to begin the process of passage restoration using mitigation funds from the I-395/Route 9 transportation study.

Sears Island Wetland Bank. This bank site consists of primarily preservation credit with two areas having restoration and creation opportunities. The restoration opportunity would involve a half-acre fill removal and replanting. The creation opportunity would be a two-acre forested wetland that consisting of grading, drainage, and planting.

Maine Natural Resources Conservation Fund. This is an MDEP program that provides permit applicants the option to pay a square-foot price for wetlands impacts that exceed regulatory thresholds. This program may be used to augment a compensation package that has inadequate mitigation for loss of specific wetlands functions and values.

Lower Penobscot Forest Project. The Lower Penobscot Forest Project is a partnership between the Nature Conservancy and the Forest Society of Maine that would conserve more than 42,000 acres. This project would be the window to a broader view of conservation in the region — a view that connects the wetlands and woods of Central Maine to the coastal forests and waters of Penobscot Bay and Machias Bay. The streams of the Lower Penobscot Forests drain into Sunkhaze Meadows National Wildlife Refuge — founded in the late 1980s when the Nature Conservancy purchased more than 10,000 acres of raised dome peat lands to protect them from peat mining. The Conservancy would purchase a conservation easement on more than 12,000 acres along the southeastern border of Sunkhaze to establish an ecological reserve. The reserve would border MDOC lands and the Lower Penobscot Forest Easement, which would be conserved by an easement purchased by the Conservancy and transferred to the state. To the south, the remote ponds and red-pine woodlands of the Amherst Tract would be conserved by fee and easement purchases by the Forest Society of Maine. To the northeast, Lower Penobscot forest lands neighbor those protected by the state and the Conservancy in the Upper Machias River Watershed. The Nature Conservancy is raising public and private funds for this project. Placing these forests under conservation is part of a larger vision of conserved lands stretching from Bangor to

Acadia National Park. There are opportunities to assist the Nature Conservancy and the Forest Society of Maine with land acquisition and/or easements.

Holden Conservation Parcels. The Holden Land Trust (HLT) is looking to preserve a large undeveloped land holding under the name of Wrentham Woods. This land consists of two adjacent parcels totaling 1,628 acres in the heart of Holden. This large tract of land was recently for sale and is under real and imminent development threat due to its proximity to the Bangor-Brewer area. The property is surrounded by development.

The Wrentham Woods has exceptional value and significance to the region as it is one of the largest undivided tracts in the greater Bangor area. It is well situated locally in the region so it can be reached within a twenty minute drive of over 50,000 Mainers. It is strategically ready for easy trail connectivity between Holden and the surrounding communities. The property has good access from Mann Hill Road, Eastern Avenue, from snowmobile trails and from the abutting inactive railroad corridor. Wrentham Woods contains open space, forests, an extensive ridge with views of the greater Bangor area, streams and ponds with beaver dams, wetlands containing a great blue heron rookery and other waterfowl and wading birds, and a variety of other wildlife such as deer, moose,

bear, bobcat, fox, coyote and turkeys. Besides maintaining the land as a working forest, HLT envisions this unique property being made available to the public for low-impact recreation such as hiking, biking, cross-country skiing, fishing, trapping, horseback riding, hunting, snow-shoeing and snowmobiling.

Holden has no conserved property to date. HLT's desire to conserve this land is consistent with the goals of the 2007 Holden Comprehensive Plan, the 2010 Holden Open Space Plan, and the 2009 Penobscot Valley Community Greenprint to help secure a high quality of life for generations of citizens.

Fish Passage. Ideally, to pass fish effectively and minimize impacts to EFHs, crossings must satisfy the following criteria:

1. **Design Peak Flow:** This represents the optimal design that minimizes the expected cost associated with flooding.
2. **Maximum Velocity:** Determining approximate maximum water velocities for assessing whether the target fish population could swim upstream against the current at critical periods.
3. **Minimum Depth:** Providing minimum depth ensures adequate water depth during periods of simultaneous low flow and fish movement. New and replacement pipes should be sized for

consistency with the natural channel bank full width and depth, with the implicit assumption that such sizing would produce automatically the desired flow velocities and depths.

4. **Gradient:** Culverts should be installed at the proper elevation to avoid perched outlets that fish cannot access. Pipes should be embedded and allowed to fill in to maintain a continuous, natural gradient.

3.10.2 Commitments

The following is a summary of the commitments from the MaineDOT and the FHWA in support of the development of Alternative 2B-2/the Preferred Alternative to avoid and minimize impacts to a variety of natural resources:

- Alternative 2B-2/the Preferred Alternative would be a controlled-access facility; motorists would be permitted to enter and exit from I-395 in Brewer and Route 9 in Eddington.
- The highway drainage and stormwater management system would be designed in accordance with the MDEP/MaineDOT/Maine Turnpike Authority Memorandum of Agreement, Stormwater Management, May 30, 2003. Under the memorandum of agreement, the MaineDOT would be required to meet the General Standards under Chapter 500 to the extent practicable as

determined through consultation with and agreement by DEP. Under the Chapter 500 General Standards for a linear project, MaineDOT would be required to treat 75% of the linear portion of Alternative 2B-2/the Preferred Alternative's impervious area and 50% of the developed area that is impervious or landscaped for water quality. To meet the General Standards, a project's stormwater management system must include treatment measures that would mitigate for the increased frequency and duration of channel erosive flows due to runoff from smaller storms, provide for effective treatment of pollutants in stormwater, and mitigate potential temperature impacts.

- During final design of Alternative 2B-2/the Preferred Alternative, MaineDOT would be conduct a Pre-Construction Potable Water Supply Characterization Assessment prior to construction. This assessment is undertaken to establish a baseline relative to the quality of water extracted from residential and commercial potable water supplies located along the project corridor.
- Erosion and sedimentation control measures would be developed and incorporated into the final design of Alternative 2B-2/the Preferred Alternative and implemented during construction, in accordance with section II of the MaineDOT's *Best Management Practices*

Manual for Erosion and Sedimentation Control (MaineDOT, 2008a).

- MaineDOT would consider green infrastructure and low-impact development practices such as reducing impervious surfaces, using vegetated swales and revegetation, protecting and restoring riparian corridors, and using porous pavements.
- During final design of Alternative 2B-2/the Preferred Alternative, the MaineDOT would further evaluate opportunities to shorten the width of road-stream crossings and preserve the natural stream bottoms in the road-stream crossings to promote the passage of aquatic organisms. Road-stream crossings would be designed in accordance with the MaineDOT Waterway and Wildlife Crossing Policy and Design Guide (MaineDOT, 2008e), except in cases where the drainage is not a stream. The proposed road-stream crossings would span the streams at a width that is 1.2 times the bankfull width (i.e., 20 percent larger than a full stream) and use either a bottomless structure or a four-sided structure with stream simulation design and natural substrate installed.
- During final design of Alternative 2B-2/the Preferred Alternative, the MaineDOT would work to further avoid and minimize the impacts to streams, wetlands, dispersal habitat for vernal pools, and floodplains. Further minimization of the impact

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to streams, wetlands, and floodplains would occur through minor shifts in the alignment of Alternative 2B-2/the Preferred Alternative and increasing the slope of fill material, which could reduce the amount of fill material placed in wetlands and floodplains. Hydraulic analysis to size the culverts would be performed during final design.

- The build alternatives would each have two wildlife passage structures, large enough to pass moose and deer, on both sides of Eaton Brook. Wildlife passages would be designed in accordance with the MaineDOT Waterway and Wildlife Crossing Policy and Design Guide (MaineDOT, 2008e) and current passage strategies.
- MaineDOT would coordinate the identification and development of compensatory mitigation with federal and state regulatory and resource agencies. MaineDOT would contact the Brewer Land Trust during the development of the mitigation plan for the I-395/Route 9 connector.
- MaineDOT's commitment to consider measures to reduce construction period impacts during project design should not be construed as a project-specific commitment. MaineDOT has long-standing and broadly-applied policies in place to mitigate air quality impacts during construction (e.g., idle reduction policy). These policies translate into standard practices for all

projects undertaken by MaineDOT and its contractors; standard language requiring contractor compliance is part of construction contracts and compliance is a presumptive part of project planning, including NEPA.

- The MaineDOT is committed to improving the intersection of Routes 9 and 46. The improvements to this intersection could be accomplished within the existing rights-of-way of Routes 9 and 46 with no impact to the natural and social features adjacent to the intersection. Given the future need and the limited scope of the improvements to the intersection, a timeframe has not been established for these intersection improvements. The proposed intersection would be studied and further developed during final design and discussed at a future public meeting.
- The MaineDOT is committed to further improving the most heavily congested section of Route 1A in the study area to the south of the I-395 interchange with Route 1A. These improvements could be accomplished within the existing right-of-way of Route 1A. Given the future need for the improvements to Route 1A, a timeframe has not been established.
- The MaineDOT would work with the town of Eddington to maintain the safety and preserve the capacity of Route 9 in the study area. The

range of possible activities that could be considered to maintain the safety and preserve the capacity of Route 9, in accordance with Maine's rules governing access management, are working with the town of Eddington to change zoning, eliminate existing and minimize future curb cuts, and working with individual landowners to acquire property or development rights.

- MaineDOT would work with town officials and evaluate Route 9 for potential improvements to improve safety for pedestrians and bicyclists along Route 9. Providing safe access for pedestrians and bicyclists along the road system typically consists of paved shoulders, sidewalks in highly developed areas, high visibility crossings where warranted, and signage to help alert drivers of the presence of bicyclists and pedestrians on the road system. A road safety audit would be conducted in conjunction with town officials and residents to develop potential immediate and longer term improvements that the town can consider as options to improve safety for pedestrians and bicyclists.
- During final design of the selected alternative, the MaineDOT would work to maintain the integrity of the existing snowmobile trail system.
- MaineDOT and FHWA would re-initiate Section 7 consultation with the USFWS when the

NLEB and/or its critical habitat become officially listed under the ESA.

The USFWS set forth commitments within the BO as Reasonable and Prudent Measures and Terms and Conditions for MaineDOT and FHWA to follow during construction of Alternative 2B-2/the Preferred Alternative.

The Reasonable and Prudent Measures are as follows:

- Minimize the adverse effects to, and incidental take of, Atlantic salmon by employing construction techniques that avoid or minimize adverse effects to water quality, aquatic and riparian habitats, and all aquatic organisms;
- Minimize the adverse effects to, and incidental take of, Atlantic salmon related to aquatic habitat connectivity and fish passage by ensuring that the project is built as proposed;
- Minimize changes to stream water quality including stream velocity, turbidity levels and temperature from existing conditions through stormwater management, application of best management practice measures during construction and as part of the roadway operation and maintenance period;
- Ensure completion of a monitoring, evaluation, and reporting program to confirm that this project has been effective in minimizing

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incidental take from the FHWA-funded activity and that the amount of allowable incidental take is not exceeded;

- Construction impacts shall be confined to the minimum area necessary to complete the project;
- Minimize effects of runoff from disturbed sites during construction through implementation of best management practices measures for erosion and sediment control;
- Monitor project implementation and compliance with conservation and best management practices measures; and
- Construction shall not inhibit Atlantic salmon passage through road-stream crossing structures or degrade critical habitat quality after project completion during the maintenance and operation period.

The Terms and Conditions listed in the BO are:

1. New impervious surface and discharged stormwater runoff quantity and quality must be treated using best management practices that incorporate water infiltration and/or filtration, avoiding direct water discharge into designated Atlantic salmon critical habitat or any surface waterway that subsequently directly discharges

into critical habitat, raising stream temperatures above pre-construction conditions.

2. All applicable conservation measures described in the BO will be fully implemented.
3. Monitoring of best management practice implementation will be conducted by MaineDOT to evaluate compliance throughout the construction period. An annual report will be submitted to the USFWS's Maine Field Office each December for the previous November through October construction period.
4. Site preparation, including cofferdam installation and removal, and temporary access road establishment, will not cause sedimentation and adverse levels of turbid water discharge into streams following erosion and sedimentation control requirements in MaineDOT's *Best Management Practices for Erosion and Sedimentation Control* document.
5. Migration/movement barrier/delay due to cofferdam placement will be minimized by limiting cofferdam placement to the time necessary to complete instream activities. The cofferdams will be removed within two days of the completion of instream construction.
6. Instream construction shall occur during the low flow period (July 15 to October 1). If MaineDOT determines that any instream

construction activity cannot be completed prior to October 1, a bypass channel shall be constructed to avoid affecting Atlantic salmon movement in Felts and Eaton Brooks. All bypass channels shall be constructed and operating by October 2 to avoid consultation reinitiation.

7. Hydroacoustic impacts from sheet pile installation (if applicable) will not adversely affect Atlantic salmon. MaineDOT shall manage noise producing activities to within noise thresholds described in this BO. Hydroacoustic monitoring shall be conducted as described and reports shall be submitted to the USFWS two weeks after completing each pile driving activity, including cofferdam completion or installed bridge piles for each bridge.
8. Disturbance and construction association with crossing structure placement will not adversely affect Atlantic salmon due to instream construction activities occurring within a cofferdam.
9. Underwater acoustic monitoring will be conducted to track noise levels associated with any sheet pile installation. Acoustic monitoring will be required wherever instream pile driving activities occur in Atlantic salmon critical habitat. A single hydrophone will be placed at 10 meters upstream and downstream of noise producing activity. MaineDOT shall continually monitor noise levels to assure activities that may approach

the published threshold values for potentially injuring juvenile salmonid will receive noise attenuation measures immediately, assuring the threshold values are not reached. MaineDOT shall provide monitoring reports to the USFWS after the completion of each cofferdam installation or immediately after completion of similar activities.

10. All Atlantic salmon mortalities from electrofishing or other related activities shall be reported to USFWS within 48 hours of occurrence. Any dead Atlantic salmon shall be immediately preserved (refrigerate or freeze) for delivery to the USFWS's office in Orono, Maine. If the USFWS is not available, contact NMFS in Orono, Maine to arrange for delivery. Upon completion of each fish evacuation event, the MaineDOT shall report the total Atlantic salmon mortality level, if any, for that event. An event is defined as any single attempt to evacuate all fish from a single cofferdam. An event is complete when the cofferdam is dewatered and construction activities may begin.
11. Adverse effects to Atlantic salmon's ability to migrate, forage, shelter, and spawn are not expected as road-stream crossing structures in critical habitat will be designed to span perennial streams using a minimal structure horizontal clearance that is 1.2 times each streams' bankfull width.

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12. To address potential effects to listed species and critical habitat resulting from fill material acquisition outside the roadway corridor and terminal interchange buffers, the MaineDOT will include language in the construction contract, via a Special Provision, which states the contractor shall avoid all potential effects to listed species and critical habitat when obtaining fill material needed for construction. The USFWS will receive a copy of this Special Provision for review prior to finalization of the Plans, Specifications and Estimate (PS&E) package. This condition is required because the USFWS's BO and the Incidental Take Statement do not evaluate nor

authorize any adverse effects or take associated with fill material acquisition outside the roadway corridor buffer and terminal interchange buffers portion of the action area. If avoidance cannot be achieved, the FHWA should reinitiate consultation or the contractor would have to apply for an ESA section 10 permit to acquire an incidental take permit, a time-consuming process that would likely affect the construction schedule.

13. For those sections of the proposed alignment that discharge into streams, MaineDOT shall design stormwater management systems that provides the greatest thermal buffering.

Chapter 4

Coordination and Consultation

Chapter 4 summarizes the coordination and consultation activities performed for this study among the federal, state, and local agencies and the public.

Throughout this study, the MaineDOT and the FHWA, acting as joint lead agencies, coordinated with federal and state regulatory and resource agencies, the tribes, Bangor Area Comprehensive Transportation System (i.e., the Metropolitan Planning Organization [MPO]), the city and towns in the study area, the regional and other special-interest groups, and the public.

Scoping. There shall be an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action. This process shall be termed “scoping” (40 CFR 1501.7).

A complete description of the public-involvement program, including meeting agendas, handouts, maps, presentations, displays, and minutes, is on the study website www.i395-rt9-study.com on the “Stay Informed” page.

4.1 Scoping and Early Coordination

In support of the preparation of the EA, a public scoping and informational meeting was held on April 11, 2001. The purposes of the meeting were to (1) review the planning and programming activities that led to the initiation of the study, and (2) provide an opportunity for public comments at the beginning of the study. The meeting was preceded by an informal open house; the formal part of the meeting consisted of a presentation and discussion of the history, purpose and needs of the study, and a broad review of strategies and alternatives for satisfying the purpose and needs. About 60 people attended the meeting, most of which was spent in questions and answers about the time required to complete the study, methods for collecting traffic data and predicting traffic volumes, relationship of the study to the east–west highway initiative, use of rail to move people and goods, sources of funding, and subsequent phases, including construction. Suggestions from the public were to use rail to ease truck traffic and reduce speed limits to improve safety.

Chapter Contents

- 4.1 Scoping and Early Coordination
- 4.2 Federal and State Agency Interagency Coordination Meetings
- 4.3 Public Involvement
- 4.4 Circulation of the DEIS and Summary of Substantive Comments

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The MaineDOT and the FHWA conducted scoping with the federal and state regulatory and resource agencies using the MaineDOT monthly interagency coordination meetings. Scoping was initiated in late 2000 and concluded in early 2001.

In December 2000, scoping and early-coordination letters were mailed to federal and state regulatory and resource agencies, the city and towns in the study area, and regional and special-interest groups, in accordance with the procedural provisions of the NEPA and requirements and policies of the MaineDOT and the FHWA. Letters accompanied by a map of the study area, a description of the study purpose and the need for action, and an outline of the study to be conducted were mailed to provide notification of the study, request specific information pertaining to the study area, and encourage participation by identifying areas of initial concern for consideration and inclusion in the study (exhibit 4.1). There were no key resources or issues of primary concern identified.

In October 2005, the FHWA elevated the I-395/Route 9 transportation study to an EIS because of potential impacts to wetlands and difficulty in identifying mitigation for those impacts. In response to the need to prepare an EIS, the FHWA published the notice of intent to prepare the EIS on December 1, 2005, in the *Federal Register* (*Federal Register*, Vol. 70, No. 230, pages 72144-72145). Additionally, MaineDOT

prepared a coordination plan to guide the agency coordination and public involvement activities to be performed.

Following the decision to prepare an EIS, a second agency scoping and field view of the study area was conducted on June 3, 2008. The agencies in attendance were the MaineDOT and the FHWA, acting as joint lead agencies, with the USACE, USEPA, and USFWS acting as cooperating agencies. The discussions included the activities conducted to date, key resources in the study area, methods for analysis of impacts to the key resources, opportunities and expectations for mitigation for impacts to waters of the United States, and specifics for conducting the study using an integrated EIS and Section 404 format. The key resources and issues of concern were potential impacts to wetlands, potential difficulty in identifying mitigation for those impacts, and wildlife habitat. Several “connectors” between the westernmost alternatives were suggested for development and analysis.

Following the decision to prepare an EIS, a second public scoping and informational meeting was held on June 4, 2008. The purposes of the meeting were to provide (1) an update to the study, the reasons that an EIS was being prepared, and the differences between an EA and an EIS; and (2) an opportunity for the public to comment and identify concerns to be addressed in the study. The meeting was preceded by an informal

Exhibit 4.1 - Summary of Scoping and Early Coordination Letters during Preparation of the EA

<i>Agency or Organization</i>	<i>Information Requested</i>	<i>Information Received</i>
Federal Agencies		
U.S. Army Corps of Engineers	General letter requesting comments	No response received
U.S. Fish & Wildlife Service	Federally listed or proposed threatened or endangered species and known critical habitats	Bald eagle is known to occur in the study area
U.S. Department of Agriculture, Maine State Office	General letter requesting comments	No response received
U. S. Department of Agriculture, Natural Resources Conservation Service, Penobscot County	General letter requesting comments	No response received
U. S. Department of the Interior, Office of Environmental Policy & Compliance	General letter requesting comments	No response received
U.S. Environmental Protection Agency	General letter requesting comments	No response received
National Marine Fisheries Service	General letter requesting comments	No response received
State Agencies		
Maine Department of Inland Fisheries and Wildlife	State listed or proposed, threatened or endangered species, known critical habitats, and other sensitive features and concerns	Map of significant and essential wildlife habitats
Maine Department of Environmental Protection, Air Quality	Previous studies of air quality in the region	No response received
Maine Department of Environmental Protection, Land and Water Quality Control	General letter requesting comments	A permit from the MDEP would be required if the proposed solution alters protected natural resources
Maine Geologic Survey	Location of groundwater wells and groundwater quality; wellhead-protection areas and intake-protection areas	List and map of known bedrock wells in the study area
Maine Department of Conservation, Forest Service	General letter requesting comments	No response received
Maine Department of Conservation, Bureau of State Parks and Lands	Identification of parks, recreation areas, or lands using funds from the LWCF	No response received
Maine State Planning Office	General letter requesting comments	No response received
Maine Natural Areas Program	State listed or proposed, threatened or endangered species, critical habitats, and other sensitive features and concerns	Two rare plant species are known to exist in the study area: American shoregrass and water stargrass
State Floodplain Management Coordinator	General letter requesting comments	Executive Order 11988 applies; use the 100-year flood standard

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Exhibit 4.1 – Summary of Scoping and Early Coordination Letters during Preparation of the EA (continued)

<i>Agency or Organization</i>	<i>Information Requested</i>	<i>Information Received</i>
Maine Department of Economic and Community Development, Office of Business Development	General letter requesting comments	No response received
Maine Department of Conservation, Grants and Community Recreation	General letter requesting comments	Three properties in the study area received funding from the LWCF
Maine Department of Agriculture, Soil and Water Conservation Commission	General letter requesting comments	No response received
Maine Department of Marine Resources	General letter requesting comments	No response received
Maine Drinking Water Program	Groundwater wells, surface water intakes, wellhead-protection areas, intake-protection areas	Maps of public water supplies in the study area
Local Agencies		
City of Brewer	General letter requesting comments	Offer of assistance from the Director of Environmental and Public Works
Town of Holden	General letter requesting comments	Requested that proposed solutions be consistent with the town's comprehensive plan
Town of Eddington	General letter requesting comments	No response received
Regional or Other		
Eastern Maine Development Corporation	General letter requesting comments	No response received
Maine Citizens for Increased Jobs and Safety	General letter requesting comments	Comments supporting the need for the study

open house; the formal part of the meeting consisted of a presentation and discussion of the legislative framework guiding the study, the study's purpose and why it is needed, the resources and features in the study area, the range of reasonable alternatives, opportunities to learn more about the study and participate in it, results achieved to date, and issues identification. About 30 people attended the meeting most of which was spent

in questions and answers about the time required to complete the study, sources of funding for the study, and subsequent phases, including construction.

Following the decision to begin preparation of an EIS, in October 2008, the MaineDOT and the FHWA mailed scoping and early-coordination letters to federal and state regulatory and resource agencies, the city and towns in the study area, and regional and

special-interest groups. The letters directed recipients to the study website (www.i395-rt9-study.com) for additional information about the study to be conducted. Several letters requested specific information to be

used in the study (exhibit 4.2). There were no key resources or issues of primary concern identified.

Exhibit 4.2 - Summary of Scoping and Early Coordination Letters during Preparation of the EIS

<i>Agency or Organization</i>	<i>Information Requested</i>	<i>Information Received</i>
Federal Agencies		
U.S. Army Corps of Engineers	General letter requesting comments	No response received
U.S. Fish & Wildlife Service	Federally listed or proposed threatened or endangered species or known critical habitats in the study area	No response received
U. S. Department of Agriculture, Natural Resources Conservation Service, Penobscot County	General letter requesting comments	No response received
U.S. Environmental Protection Agency, Region I	General letter requesting comments	No response received
U.S. Geological Survey	General letter requesting comments	No response received
Federal Emergency Regulation Commission	General letter requesting comments	No response received
Federal Railroad Administration	General letter requesting comments	No response received
Federal Transit Administration	General letter requesting comments	No response received
National Oceanographic Atmospheric Administration Fisheries	General letter requesting comments	No response received
National Marine Fisheries Service	General letter requesting comments	No response received
Tribes		
Penobscot Indian Nation	General letter requesting comments	No response received
Houlton Band of Maliseet Indians	General letter requesting comments	No response received
Aroostook Band of Micmacs	General letter requesting comments	No response received
Passamaquoddy Tribe of Indians	General letter requesting comments	No response received
Passamaquoddy Tribe Pleasant Point	General letter requesting comments	No response received

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Exhibit 4.2 – Summary of Scoping and Early Coordination Letters during Preparation of the EIS (continued)

Agency or Organization	Information Requested	Information Received
State Agencies		
Maine Department of Inland Fisheries and Wildlife	State listed or proposed threatened or endangered species, known critical habitats, or other sensitive features or concerns	Bald eagle nest locations and proposed rules protecting Atlantic salmon
Maine Department of Environmental Protection, Air Quality	Previous studies of air quality in the region	No response received
Maine Department of Environmental Protection, Land and Water Quality Control	General letter requesting comments	No response received
Maine Historic Preservation Commission	General letter requesting comments	No response received
Maine Geologic Survey	Location of groundwater wells and groundwater quality; wellhead-protection areas and intake-protection areas	Location of groundwater wells wellhead-protection areas, and intake-protection areas
Maine Department of Conservation	General letter requesting comments	No response received
Maine Department of Conservation, Forest Service	General letter requesting comments	No response received
Maine Department of Conservation, Bureau of State Parks and Lands	Identification of parks, recreation areas, or lands purchased with funds from the LWCF	No response received
Maine Atlantic Salmon Commission	General letter requesting comments	No response received
Maine Department of Conservation, Northern Region Bureau of State Parks and Lands	General letter requesting comments	No response received
Maine State Planning Office	General letter requesting comments	Maine floodplain management program floodplain issues
Maine Natural Areas Program	State listed or proposed threatened or endangered species, critical habitats, or other sensitive features or concerns	No response received

Exhibit 4.2 – Summary of Scoping and Early Coordination Letters during Preparation of the EIS (continued)

Agency or Organization	Information Requested	Information Received
State Floodplain Management Coordinator	General letter requesting comments	No response received
Maine Department of Economic and Community Development, Office of Community Development	General letter requesting comments	No response received
Maine Department of Agriculture Soil and Water Conservation Commission	General letter requesting comments	No response received
Maine Department of Marine Resources	General letter requesting comments	Species of diadromous fish
Maine Drinking Water Program	Groundwater wells, surface water intakes, wellhead-protection areas, intake-protection areas	No response received
Maine Emergency Management Agency	General letter requesting comments	No response received
Maine Department of Conservation, Off-Road Vehicles Division	General letter requesting comments	No response received
Maine Tree Committee	General letter requesting comments	No response received
Local		
City of Brewer	General letter requesting comments	No response received
Town of Holden	General letter requesting comments	No response received
Town of Eddington	General letter requesting comments	No response received
Town of Clifton	General letter requesting comments	No response received
Bangor Area Comprehensive Transportation System	General letter requesting comments	No response received
Regional or Other		
Eastern Maine Development Corporation	General letter requesting comments	No response received
Boy Scouts of America	General letter requesting comments	No response received
East – West Highway Association	General letter requesting comments	No response received
Maine Motor Transport Association	General letter requesting comments	Letter stating support for the study
Maine Snowmobile Association	General letter requesting comments	No response received

4.2 Federal and State Agency Interagency Coordination Meetings

This study was presented to the federal and state regulatory and resource agencies that attended the MaineDOT monthly interagency coordination meetings on eight occasions during preparation of the EA (exhibit 4.3). The federal and state regulatory and resource agencies that regularly attend these meetings are the USACE, USEPA, USFWS, NMFS, MDEP, MDIFW, Maine Historic Preservation Commission (MHPC), Maine Department of Marine Resources (MDMR), and Maine Department of Conservation (MDOC). Other federal and state regulatory and resource agencies attend these meetings as needed.

This study was presented to the federal and state regulatory and resource agencies that attended the MaineDOT monthly interagency coordination meetings on three occasions during preparation of the EIS (exhibit 4.4). The major issues addressed were the potential impacts to wetlands, streams, vernal pools, unfragmented habitat, the potential mitigation for those impacts, and the development and refinement of the build alternatives to further avoid and minimize impacts to the natural and social environment features in the study area. The cooperating agencies concurred with the range of reasonable alternatives to

be retained for detailed analysis in the EIS in January 2008 in the DEIS.

4.3 Public Involvement

Public participation was initiated early in the study to incorporate public comments and concerns into the development and analysis of the study needs, purpose, range of reasonable alternatives, potential resultant environmental impacts, and development of conceptual mitigation measures. Public participation continued throughout the study. The public-involvement program included the scoping meetings, meetings of the PAC, two public meetings, a website, information posters, and newsletters.

4.3.1 Public Advisory Committee

At the beginning of the study, a PAC consisting of local officials, business owners, the MPO, and private citizens from Bangor, Holden, Brewer, Eddington, Clifton, Bucksport, and Calais was formed. The purpose of the PAC and its meetings was to provide a forum and support the overall public-involvement program. The PAC participated in the study by meeting periodically with the MaineDOT and the FHWA and providing guidance on local issues and concerns. The PAC meetings were working sessions open to the public and included time for questions and answers

Exhibit 4.3 - Summary of Interagency Coordination Meetings and Results during Preparation of the EA

<i>Interagency Meeting</i>	<i>Discussion and Results</i>
November 14, 2000	The study was introduced and an overview of activities was provided.
February 13, 2001	The needs for the study, its purpose, and the natural resource and social environmental features in the study area were presented. The agencies in attendance concurred with the information presented.
October 9, 2001	The alternatives-analysis information to date was presented. The agencies in attendance concurred with the range of reasonable alternatives considered and the preliminary screening of alternatives to date. Attended by: USACE, USEPA, USFWS, NMFS, MDEP, MDIFW, MASC, and MDMR
March 12, 2002	An update to the alternatives analysis was presented. The agencies in attendance concurred with the range of alternatives considered but stated that Alternative 2B was practicable. The agencies requested that additional impacts to people living along Route 9 be quantified. Attended by: USACE, USFWS, and MDEP
October 8, 2002	An update to the alternatives analysis and the direction of the study were presented. The agencies in attendance concurred with the range of alternatives considered and the direction of the study. Attended by: USACE, USFWS, NMFS, and MASC
March 11, 2003	The agencies in attendance concurred with dismissing Alternative 2C-2 due to its greater impacts to farmlands and farming operations than other alternatives. Attended by: USACE, USEPA, USFWS, MDEP, MDIFW, and MASC
May 13, 2003	The agencies in attendance concurred with dismissing the remaining build alternatives except Alternative 3EIK-2, pending review of the “Transportation Improvement Strategies and Alternatives Analysis Technical Memorandum and U.S. Army Corps of Engineers Highway Methodology Phase I Submission”—a document that summarizes and presents results of the alternatives-analysis process. Attended by: USACE, USEPA, USFWS, MDEP, MDIFW, MASC, and MHPC
November 14, 2003	A modification of Alternative 2B-1 was discussed. It was agreed by the agencies in attendance that this modification should be dismissed from further consideration. Attended by: USACE, USFWS, MDEP, and MDOC

(exhibit 4.5). Seventeen PAC meetings were held during the preparation of the EA.

Following the decision to begin the preparation of the EIS, a new PAC was formed. This PAC consisted of many of the same individuals who had participated in the study to date and several others with knowledge of the area and potential issues and concerns (Appendix B of the DEIS). These PAC meetings were working sessions open to the public and included time for

questions and answers (exhibit 4.6). Three PAC meetings were held during the preparation of the EIS.

4.3.2 Public Informational Meetings

Two public meetings were held during the preparation of the EA. The first meeting was the public scoping and informational meeting held on April 11, 2001 (section 4.1).

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Exhibit 4.4 - Summary of Interagency Coordination Meetings and Results during Preparation of the EIS

Interagency Meeting	Discussion and Results
October 9, 2007	<p>An update to the study was provided. The update consisted of changes in land use in the study area since 2003 and the current range of reasonable alternatives being considered and analyzed for obtaining the USACE Phase I approval.</p> <p>Attended by: USACE, USEPA, USFWS, FHWA, MDMR, MDEP, and Maine Natural Areas Program (MNAP)</p>
December 9, 2008	<p>An update to the alternatives analysis was presented. The update consisted of results of the six “connectors” between the three westernmost alternatives. The agencies in attendance concurred in continuing to study:</p> <ul style="list-style-type: none">• 5A2E3K to 2B-2 connector 1 and/or 5A2E3K to 2B-2 connector 2• 5A2E3K to 2B-2 connector 1 to 2B-2 to 5A2E3K to 2B-2 connector 2 and/or• 5A2E3K to 2B-2 via connector 1 to 2B-2 to 5A2E3K via connector 3 <p>The first two Alternatives beginning with 5A were chosen and named 5A2E3K-1 and 5A2E3K-2, respectively. Alternative 5B2E3K was modified to avoid the Dirigo Drive Business Park and named Alternative 5B2E3K-1.</p> <p>Attended by: USACE, USFWS, NMFS, FHWA, and MDIFW</p>
May 12, 2009	<p>An update to the alternatives analysis and the resultant impacts was presented. The agencies in attendance concurred with dismissing Alternatives 1 and 3A-3EIK-1 from further consideration. The agencies requested a new alternative to be considered: 2B-2 plus improvements to Route 9 to East Eddington with a section on new alignment to the north of the intersection of Routes 9 and 46. Two other changes to alternatives were requested: (1) for the alternatives that begin with 5A, develop a partial cloverleaf interchange with Route 1A; and (2) for Alternative 3EIK-2, move a portion of the alternative closer to Clark Hill Road.</p> <p>Attended by: USACE, USEPA, USFWS, NMFS, FHWA, MDEP, and MDOC</p>
January 12, 2010	<p>The alternatives in the Family of 5s was presented and discussed. Alternative 2B-2 is proximate to the family of 5s and shares partial alignment with one of the 5s. In light of the Executive Order on floodplains, the MaineDOT suggested that Alternative 5B2E3K-1 could be dismissed from further consideration because of its potential impacts to floodplains; according to the EPA, the potential impacts to floodplains are not a sufficient reason to dismiss an alternative from further consideration because lost flood storage area can be replaced. Alternative 5B2E3K-1 should be retained for further consideration because of part of its alignment is adjacent to a Bangor Hydro-Electric utility easement. The Bangor Hydro-electric utility easements are disturbed and the resources within them are of lesser value than those in undisturbed locations. The Bangor Hydro-Electric utility easements are used for recreation and portions of them beneath the electrical lines are periodically mowed.</p> <p>Attended by: USACE, USFWS, FHWA, MDMR, MDOC, and MDEP</p>
October 11, 2011	<p>An update to the design criteria and conceptual design of the build alternatives retained for further consideration and the alternatives analysis and the resultant impacts was presented. The agencies concurred with identifying Alternative 2B-2 as the Preferred Alternative for satisfying the study purpose and need and satisfying the USACE’s overall and basic project purpose with the least adverse impact to the environment. It was agreed that Route 9 has sufficient capacity and would operate at comparable speeds in the design year and no improvements to Route 9 would be considered reasonably foreseeable. The MaineDOT would update the list of opportunities for compensatory wetland mitigation and include it in the DEIS that is circulated for public review to allow an opportunity to comment on mitigation.</p> <p>Attended by: USACE, USEPA, USFWS, NMFS, FHWA, MDMR, MDEP, MDIFW</p>
December 13, 2011	<p>The administrative DEIS was distributed to the Federal Cooperating Agencies for review and comment. The Federal Cooperating Agencies present provided a synopsis of their review of the administrative DEIS so far. The USACE and the USFWS reported that their review of the administrative DEIS was almost complete and no major gaps in material were found. Moving forward, the joint lead agencies – the FHWA and MaineDOT – discussed circulating the DEIS and holding a joint public hearing with the USACE.</p> <p>Attended by: FHWA, USACE, USFWS, MDMR, MNAP</p>

Exhibit 4.5 - Summary of PAC Meetings during Preparation of the EA

PAC Meeting	Discussion and Results
September 11, 2000	Introduced the study-team participants and reviewed the scope of studies to be conducted, NEPA process, role of the PAC, and scope of the public-involvement and agency-coordination programs.
October 2, 2000	Discussions consisted of the purpose and needs for the study and how they are used in decision making. Three needs were discussed: system linkage, traffic congestion, and safety.
November 15, 2000	Discussions consisted of the study needs, goals, and objectives; study-area boundary; and important natural and social features in the study area.
January 17, 2001	Discussions consisted of the study needs, development of the study purpose and needs statement, and further identification of natural and social features.
February 28, 2001	Results of the interagency coordination, crash data, and traffic forecasts were discussed. Performance measures for developing alternatives were developed.
May 2, 2001	Results of the informational and scoping meeting held in April 2001 were discussed. Other items discussed were travel-demand forecasting, natural and social features, and preliminary alternatives identification and development. To develop alternatives, the study team, with the PAC, created 1,000-foot-wide corridors for alternatives that satisfy the needs and purpose of the study with the least adverse environmental impacts. The corridors were drawn on the mapping of features and were subsequently refined and developed into 46 alternatives.
June 27, 2001	The range of reasonable alternatives, their overall feasibility, and preliminary impacts were presented. Results of the preliminary alternatives screening were explained. Changes were suggested to avoid and minimize impacts. Four additional alternatives were suggested.
July 18, 2001	The preliminary impacts for the additional alternatives developed were presented. A summary of traffic forecasting and analysis was presented.
October 23, 2001	Discussions consisted of results of the public and interagency coordination meetings in September and October 2001, a summary of regional transportation improvements and connected actions, traffic forecasting and analysis of alternatives, and a summary of the MaineDOT right-of-way and appraisal process. Alternative 1-4B was suggested for development and analysis.
December 19, 2001	Discussions consisted of impacts of Alternative 1-4B, range of alternatives, decision-making framework, and a summary of traffic forecasting and LOS analysis for the alternatives. The rationale for dismissing Alternatives 3E-2C and 3E-2C-2E was also discussed.
February 20, 2002	Comprehensive plans for the Bangor area, the city of Brewer, and the towns of Holden and Eddington were reviewed. Alternatives were discussed and identified for dismissal from further consideration.
May 22, 2002	Discussions consisted of results of the interagency coordination meeting in March 2002, the range of reasonable alternatives retained for continued study, and conceptual interchange and intersection designs. Nine new alternatives were developed.
July 24, 2002	Discussions consisted of a resolution from Holden, the alternatives retained for continued study, the reasons for dismissing alternatives, and the traffic operational characteristics of the alternatives. Eight new alternatives were suggested.
September 18, 2002	Discussions consisted of review of the alternatives retained for continued study and their potential impacts.
November 20, 2002	Discussions consisted of the range of reasonable alternatives, results of the interagency coordination meeting in October 2002, a summary of the MaineDOT right-of-way acquisition and relocation assistance programs, a summary of traffic forecasting, measures of effectiveness, and the rationale for dismissing a number of alternatives from further consideration. The town of Holden presented the results of its town meetings and an alternative that parallels existing utility corridors. Following this meeting, three alternatives – 2C-1, 2C-2, and 2C-1/2B-1 – were developed.
January 15, 2003	Discussions consisted of the results of two town of Holden and a town of Eddington sponsored meetings and specific facets of Alternatives 2C-1, 2C-2, and 2C-1/2B-1. Alternatives 2C-2 and 3A-3EIK-1 were dismissed from further consideration. Alternative 4B and suggestions for improving it were reviewed.
April 30, 2003	Discussions consisted of dismissing Alternatives 2B-1 and 3A-3EIK-1 from further consideration, modifications to Alternative 3EIK-2 to further reduce impacts, the results of the March 11, 2003, interagency meeting and the March 28, 2003, meeting with the USACE and the USEPA, and retaining the No-Build Alternative, Alternative 3EIK-2, and, potentially, Alternative 2C-1/2B-1 for further consideration.

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Exhibit 4.6 - Summary of PAC Meetings during Preparation of the EIS

PAC Meeting	Discussion and Results
August 20, 2008	Introduced the study-team participants and reviewed the process for preparing an EIS and how the study would be performed, an overview of the PAC and its function and ground rules, results of the public and agency scoping meetings, the public-involvement and agency-coordination programs, and the schedule for the study moving forward.
November 19, 2008	The PAC process and meeting ground rules were reviewed, followed by a review and discussion of the town of Holden's October 2008 resolution, traffic data, conceptual design of the range of reasonable alternatives including the "connectors," ways to further avoid and minimize impacts, and short-term activities to be performed.
April 15, 2009	An update to the alternatives analysis, the resultant impacts, and next steps were presented. The PAC was informed that Alternatives 5B2E3K and Alternative 2B-2 with connectors to 5A2E3K were dismissed from further consideration in favor of retaining variations of these alternatives with less adverse impact to the environment. The PAC suggested that the MaineDOT and the FHWA further reduce the range of alternatives being considered to only those that the MaineDOT and the FHWA are most seriously considering and rename those alternatives using simpler names.

The second public meeting was held on September 19, 2001. The purpose of the meeting was to provide an update on the progress of the study since the public scoping and informational meeting in April 2001. The study purpose and needs, range of alternatives considered for satisfying needs and purpose, preliminary alternatives screening, the range of alternatives retained for further consideration, and next steps were presented. The concerns and suggestions for improving the study were to look for more immediate ways to ease congestion on I-395 and Route 1A, give consideration to the No-Build Alternative, consider the cost effectiveness of alternatives as part of the evaluation, seek ways to minimize impacts to individual properties, enforce the no-passing regulation on Route 46, reinstitute freight and passenger rail on the former Calais branch, consider wildlife mortality in the evaluation

of alternatives, and consider actions to improve the safety on Route 46. There were no key resources or issues of primary concern identified at that time.

4.3.3 Website

A study-specific website (www.i395-rt9-study.com or the MaineDOT website: www.maine.gov/mdot/major-planning-studies/major-planning-stds.php) was developed early in the study and updated frequently. The website consists of a home page, a study overview, frequently asked questions, a "Stay Informed" page, resources (i.e., maps and publications), a glossary, and a links page. Shortly after each meeting, materials in support of the public-involvement program, including meeting agendas, handouts, maps, presentations, displays, and minutes, were placed on the website on the "Stay Informed" page.

4.3.4 Public Information

In support of the public-involvement program, circulation of public information was an important part of the study. Public information was released throughout the study in the forms of newspaper articles, press releases, newsletters, and posters on display in city and town offices.

4.4 Circulation of the DEIS and Summary of Substantive Comments

In early March 2012, MaineDOT mailed approximately 200 newsletters to property owners in the study area advising them of the status of the study, the circulation of the DEIS, opportunities to pose questions to MaineDOT and FHWA and receive answers, and provide comments. MaineDOT delivered approximately 250 copies of the newsletter to the City of Brewer and the towns of Holden, Eddington, and Clifton for distribution.

The MaineDOT and the FHWA announced the availability of the I-395/Route 9 Transportation Study DEIS on March 23, 2012 (Federal Register, Vol. 77, No. 57). A 60-day comment period immediately followed, during which MaineDOT and FHWA invited Federal, State and local agencies, Tribes, organizations, and individuals to submit comments on the I-395/Route 9 Transportation Study DEIS. The MaineDOT and FHWA received 11

comment letters (some with attachments), seven comment forms (some with attachments), 79 comment e-mails and one petition (Appendix A).

Two open houses and a public hearing were held during the 60-day comment period. The first open house was on April 4, 2012 at the Brewer Auditorium and the second open house was on May 2, 2012 at the Eddington Town Office. The purposes of the two open houses were to 1) meet with people with an interest in the study to answer questions about the study and, 2) receive suggestions for further avoidance and minimization of potential impacts from the build alternatives and ways to improve the analysis of alternatives prior to decision-making. The Public Hearing was held on May 2, 2012 at the Eddington School immediately after the open house; a transcript of the hearing was prepared. Nineteen attendees offered comments during the public hearing. The purpose of the public hearing was for the public to offer comments on the DEIS prior to preparation of the FEIS and decision-making; the public hearing was not a question and answer session. The public comment period on the I-395/Route 9 Transportation Study DEIS closed on May 15, 2012.

The MaineDOT submitted a preliminary permit application in accordance with Section 404 of the CWA to the USACE. Section 404 of the CWA requires a permit for the discharge of dredged and fill material into Waters of the U.S., including wetlands. In response to

What is a Substantive Comment?

A substantive comment is one which suggests the modifications of an alternative, suggests the development and evaluation of an alternative not previously considered, supplements, improves or modifies analyses, or corrects a factual error.

40 CFR 1503.4: Response to Comments

- A. An agency preparing a final environmental impact statement shall assess and consider comments both individually and collectively, and shall respond by one or more of the means listed below, stating its response in the final statement. Possible responses are to:
1. Modify alternatives including the proposed action.
 2. Develop and evaluate alternatives not previously given serious consideration by the agency.
 3. Supplement, improve, or modify its analyses.
 4. Make factual corrections.
 5. Explain why the comments do not warrant further agency response, citing the sources, authorities, or reasons which support the agency's position and, if appropriate, indicate those circumstances which would trigger agency reappraisal or further response.
- B. All substantive comments received on the draft statement (or summaries thereof where the response has been exceptionally voluminous), should be attached to the final statement whether or not the comment is thought to merit individual discussion by the agency in the text of the statement.
- C. If changes in response to comments are minor and are confined to the responses described in paragraphs (a)(4) and (5) of this section, agencies may write them on errata sheets and attach them to the statement instead of rewriting the draft statement. In such cases only the comments, the responses, and the changes and not the final statement need be circulated (Sec. 1502.19). The entire document with a new cover sheet shall be filed as the final statement

the preliminary permit application, the USACE issued their public notice soliciting comments on the project and range of issues addressed in the DEIS. The comment period on the preliminary permit application closed on May 17, 2012. The USACE's LEDPA determination was received by MaineDOT on July 31, 2013 (Appendix B).

The requirements for responding to comments received on DEISs are contained in 40 CFR 1503.4. When identifying substantive comments, MaineDOT and FHWA closely examined each letter, form and email and took a conservative approach to identifying substantive comments; if a remark appeared to suggest modifying an alternative, develop and evaluate a new alternative, improve or modify the analysis, or make factual corrections, it was identified as a substantive comment (Appendix A).

Chapter 5

List of Preparers

Federal Highway Administration

Mark Hasselmann

Qualifications:

- B.S. Environmental Science, Eastern Connecticut State University, 1984
- 20 years experience in procedural and technical guidance to assure compliance of the environmental analysis with federal requirements

Responsibilities:

Procedural guidance and document review

Cheryl Martin

Qualifications:

- B.S. Civil Engineering, University of Maine, 1985
- 26 years experience in transportation project development, including 15 years in procedural and technical guidance to assure compliance of the environmental analysis with federal requirements

Responsibilities:

Procedural guidance and document review

Peter Kleskovic, PE

Qualifications:

- B.S. Civil Engineering, Newark College of Engineering, 1974
- M.S. Civil Engineering, New Jersey Institute of Technology, 1977
- 30 years experience in transportation project development

Responsibilities:

Procedural guidance and document review

Gerald Varney, PE

Qualifications:

- B.S. Civil Engineering, West Virginia University, 1993
- M.S. Civil Engineering, West Virginia University, 1995
- 11 years experience in highway design and engineering

Responsibilities:

Procedural guidance and document review

Cassandra Chase

Qualifications:

- B.S. Civil Engineering, University of Maine, 2010

Responsibilities:

Procedural guidance and document review

Maine Department of Transportation

Russell D. Charette, P.E.

Qualifications:

- A.S. Civil Engineering Technology, University of Maine, 1974
- B.S. Civil Engineering, University of Maine, 1977
- M.B.A. University Of Southern Maine, 1987
- 34 year's experience in multi-modal transportation planning, design and development.

Responsibilities:

Project Management

Richard Bostwick, PWS

Qualifications:

- B.Sc. Biology, Mount Allison University, 1978
- 28 years experience identifying natural resources and assessing impacts from transportation projects

Responsibilities:

Natural environment analysis

Raymond Faucher, PE

Qualifications:

- A.S. Civil Engineering, University of Maine, 1970
- 35 years experience in planning and design of transportation projects

Responsibilities:

Procedural oversight and guidance

Eric Ham

Qualifications:

- University of Maine at Orono, BS in Biology, 2006
- 4 years of experience with environmental field assessments

Responsibilities:

Endangered Species Act Review and Compliance

Edward W. Hanscom

Qualifications:

- B.S. Civil Engineering, University of Maine, 1977
- M.S. Civil Engineering, Purdue University, 1979
- 32 year's experience in transportation planning and traffic engineering

Responsibilities:

Transportation review

Nathan Howard

Qualifications:

- Bachelor of Fine Arts (BFA) in Creative Writing, Environmental Planning, and Geography, University of Maine at Farmington, 2000
- Master of Public Administration (MPA), University of Maine, 2008
- 11 years experience in transportation planning and air quality and noise analysis

Responsibilities:

Air and noise analysis review

Judith Lindsey**Qualifications:**

- B.S. Environmental Planning, Unity College, 1979
- 27 years experience in compliance with NEPA regulations, policies, and documentation requirements; community impact assessment; and social impact assessment methodologies and analysis

Responsibilities:

Study manager document review

Michael Morgan**Qualifications:**

- AS Civil Engineering, University of Maine, Orono, Maine, 1970
- 42 years of experience in transportation analysis

Responsibilities:

Traffic analysis and forecasting

Dan Tierny**Qualifications:**

- 8 years experience in natural resource review and GIS analysis.
- BS in Wildlife Ecology, University of Maine at Orono, 1999
- MS in Biodiversity, Conservation, and Policy, State University of New York at Albany, 2001.

Responsibilities:

Natural resource (vernal pools, stream and wetland review) survey and identification.

Deane C. Van Dusen**Qualifications:**

- A.S. Nursery Management, Stockton School of Agriculture, 1977
- B.S. Plant and Soils Science, University of Massachusetts, 1979
- M.S. Landscape Architecture, University of Massachusetts, 1981
- 25 years experience in landscape design and field studies, including wetland delineation, threatened and Endangered species surveys, wildlife and transportation studies, and wetlands mitigation

Responsibilities:

Mitigation

Cooperating Agencies**U.S. Environmental Protection Agency****Mark Kern****Qualifications:**

- B. A. Philosophy, Rider University, 1975
- M.S. Environmental Science, Yale University, 1984
- At EPA for 25 years. Over 20 years in the wetlands program.

Responsibilities:

Wetlands and wildlife review.

U.S. Fish & Wildlife Service

Wende S. Mahaney

Qualifications:

- M.S. Wildlife Science, New Mexico State University, 1987
- 23 years experience in wildlife science

Responsibilities:

Endangered Species Act, NEPA reviews,
CWA permitting

U.S. Army Corps of Engineers

Jay Clement

Qualifications:

- B.A. Zoology, The University of Maine, 1982
- 28 years experience in Corps permitting and enforcement

Responsibilities:

Administering Corps permit program within the State of Maine, Senior Project Manager for Corps Maine Project Office

Maine Historic Preservation Commission

Leon Crammer

Qualifications:

- M.A. Historic Archaeology, The University of Maine, 1988
- 20 years experience in archeological resources

Responsibilities:

Archaeological resources

Michael Johnson

Qualifications:

- M.S. Historic Preservation, University of Vermont, 2002
- 10 years experience in Historic Preservation

Responsibilities:

Historic resources

John P. Mosher

Qualifications:

- MA New England Studies (historic archaeology focus), University of Southern Maine 1991
- 12 years experience with Maine Historic Preservation as archaeologist

Responsibilities:

Archaeological resources

Arthur Spiess

Qualifications:

- PhD in Anthropology (archaeology focus), Harvard University, 1978.
- 33 years as SHPO archaeologist, Maine Historic Preservation Commission.

Responsibilities:

Archaeological resources

Gannett Fleming, Inc.

William M. Plumpton, CEP

Qualifications:

- B.S. Environmental Resource Management, The Pennsylvania State University, 1984
- 25 years experience in environmental impact assessment and NEPA compliance

Responsibilities:

Study manager

Scott W. Duncanson, AICP

Qualifications:

- B.A. Political Science, University of New Hampshire, 1984
- M.U.A. Urban Affairs/Planning, Boston University, 1991

- 23 years experience in environmental planning, land use and socioeconomics, transportation planning, and NEPA compliance

Responsibilities:

Social environmental studies

Katherine E. Sharpe

Qualifications:

- B.A. English, Minor in Environmental Economics, Minor in Business, The Pennsylvania State University, 1999
- M.P.S. Environmental Management, Cornell University, 2003
- 9 years experience in environmental planning, socioeconomic analysis, and NEPA compliance

Responsibilities:

Social environmental studies

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Craig Shirk, AICP

Qualifications:

- B.A. Geoenvironmental Studies, Shippensburg University, 1989
- M.S. Environmental Science, State University of New York, College of Environmental Science and Forestry, 1994
- 17 years experience in environmental planning, transportation planning, and NEPA compliance

Responsibilities:

Natural environment studies

Danielle Stemrich

Qualifications:

- B.A. Environmental Studies, Kings College, 2006
- M.S. Geoenvironmental Studies, Shippensburg University, 2008
- 4 years experience in NEPA compliance

Responsibilities:

Document preparation

Harvey S. Knauer, PE, PLS

Qualifications:

- B.S. Civil Engineering, University of Miami, 1967
- M.C.E. Villanova University, 1974
- 39 years engineering and environmental experience

Responsibilities:

Air quality and noise

Ahmed El-Aassar, EI

Qualifications:

- B.Sc., Civil Engineering, Cairo University, Egypt, 1995
- M.Sc., Water Resources Management, The University of Birmingham, United Kingdom, 1997
- M.Sc., Environmental Engineering, The University of Central Florida, 2002
- Ph.D., Environmental Engineering (noise and air pollution related), The University of Central Florida, 2006
- 13 years experience in noise and air quality analysis

Responsibilities:

Air quality and noise

Daniel W. Farber

Qualifications:

- A.S. Electrical and Electronics Technology, The Pennsylvania State University, 1969
- 33 years experience in noise analysis

Responsibilities:

Noise

Debra L. Plumpton, PG

Qualifications:

- B.S. Geology, Slippery Rock State College, 1978
- M.S. Geological Engineering, University of Missouri-Rolla, 1980
- 28 years experience in geology and groundwater analysis

Responsibilities:

Geology and groundwater

David A. Hamlet, PE

Qualifications:

- B.S. Civil Engineering, Rensselaer Polytechnic Institute, 1992
- M.E. Engineering Science, The Pennsylvania State University, 1995
- 16 years experience in preliminary and final highway design and construction services

Responsibilities:

Preliminary design

Nathaniel S. Kirchner, PE

Qualifications:

- B.S. Civil Engineering, The Pennsylvania State University, 1999
- Open Plan Basics – Project Management, Productivity Point, 2001
- 10 years experience in preliminary and final highway design and construction services

Responsibilities:

Preliminary design

Aaron K. Holt

Qualifications:

- A.S. Specialized Technology, The Art Institute of Philadelphia, 2002
- 10 years experience in graphic design

Responsibilities:

Graphic design and document layout

Russell A. Spangler

Qualifications:

- B.A. Communications and Media Art, Neumann University, 2010
- M.S. Publishing, Pace University, 2012
- 5 years experience in marketing, publication design and editing

Responsibilities:

Graphic Design, document layout and editing

A.K. Environmental

Patricia Riley

Qualifications:

- B.S. Biology/Environmental Science, East Stroudsburg University, 1983
- M.S. Ecology, Rutgers University, 1986
- 24 years experience with environmental studies and permits

Responsibilities:

Right-of-way impact analysis

Doug Avelino

Qualifications:

- A.A.S. Forest Science, Pennsylvania State University, 2006
- 6 years experience with environmental studies

Responsibilities:

Right-of-way data analysis

Julie Cormier

Qualifications:

- B.F.A., Printmaking, University of Iowa, 1977
- Associate of Science, Health Information Technology, University of Maine, 1992
- 7 years experience with real estate research

Responsibilities:

Right-of-way field data collection

TechEdit Services

Constance G. Burt

Qualifications:

- B.S. Social Work, Florida State University, 1972
- 30 years experience as a technical editor

Responsibilities:

Technical editing

Chapter 6

Distribution List

This EIS was distributed to federal, state, and local agencies with jurisdiction by law or special expertise and to agencies, tribes, and local entities that may be interested in the study.

Elected Officials

U.S. Senator Susan Collins
68 Sewall Street, Room 507
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U.S. Senator Angus King
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Augusta, ME 04330

U.S. Representative Chellie Pingree
2 Portland Fish Pier
Suite 304
Portland, ME 04101

U.S. Representative Bruce Poliquin
6 State Street, Suite 101
Bangor, ME 04401

State Senator Kimberly C. Rosen
3 State House Station
Augusta, ME 04333

State Representative Arthur C. Verow
20 Greenwood Drive
Brewer ME 04412

State Representative Peter A. Lyford
197 Jarvis Gore Drive
Eddington ME 04428

U.S. Federal Government

Federal Energy Regulatory Commission
Environmental Evaluation Branch
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Federal Emergency Management Agency
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Federal Railroad Administration
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Federal Transit Administration
Region 1 Office Transportation Systems Center
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U.S. Department of the Interior
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Office of Environmental Policy & Compliance
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Washington, DC 20240

U.S. Environmental Protection Agency
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U.S. Fish & Wildlife Service
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Tribal Government

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Houlton Band of Maliseet Indians
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Littleton, ME 04730

Aroostook Band of Micmacs
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Maine Bureau of Parks and Lands
Attn: Will Harris, Director
22 State House Station
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Maine Forest Service
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22 State House Station
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Maine Geological Survey
Attn: Robert Marvinney, Director
22 State House Station
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Maine Department of Economic and Community
Development
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59 State House Station
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Maine Natural Areas Program
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Maine Department of Marine Resources
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Maine Department of Environmental Protection
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Maine Department of Inland Fisheries and Wildlife
James Hall, Regional Biologist
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Local Government

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Stephen Bost, City Manager
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Chapter 7

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